DECEMBER 27, 1954

Electrical World

Price 35 Cents

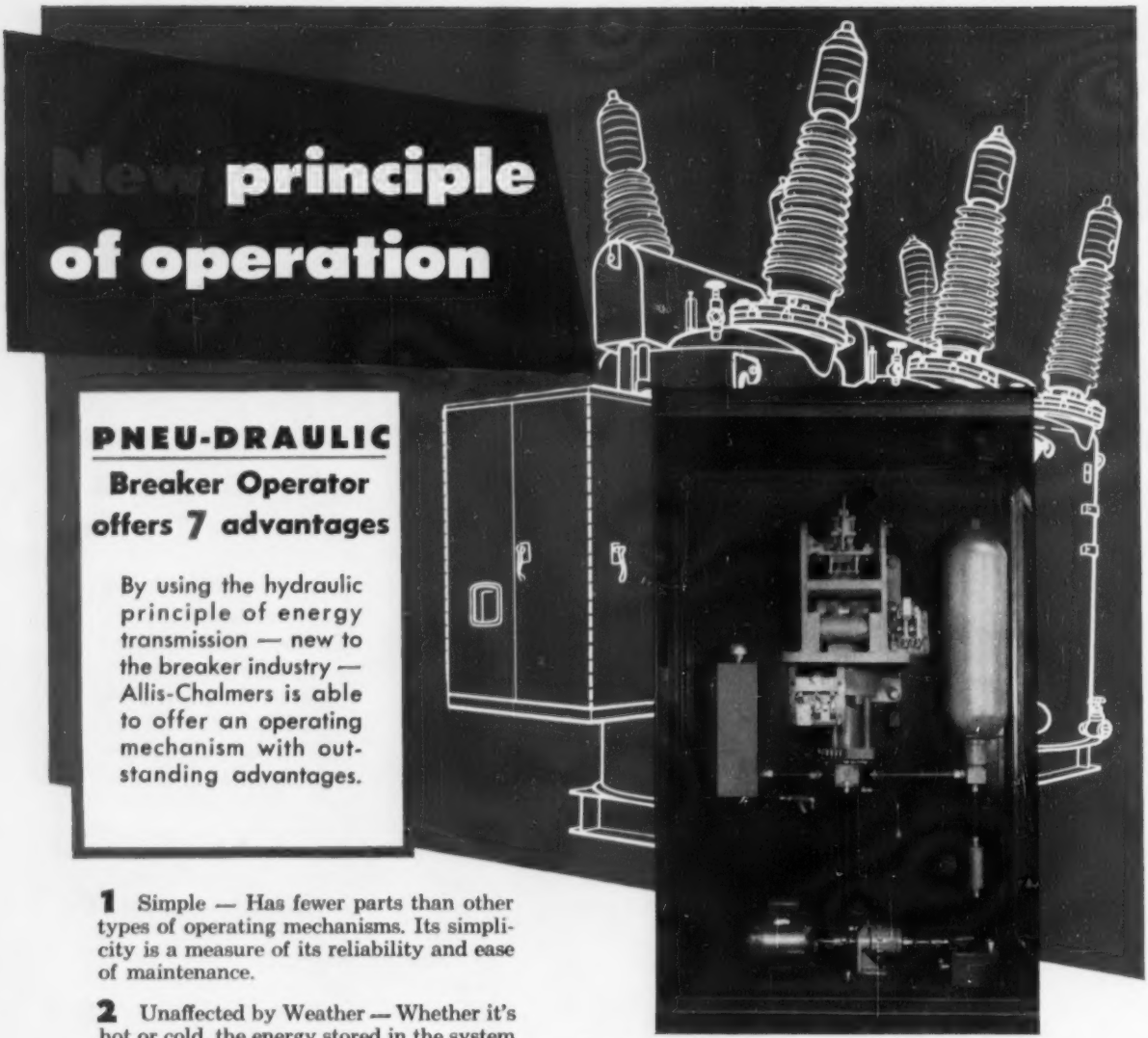
A McGRAW-HILL PUBLICATION

1954 Year-end review and predictions for 1955

a report by the editors

See page 55

New principle of operation



PNEU-DRAULIC Breaker Operator offers 7 advantages

By using the hydraulic principle of energy transmission — new to the breaker industry — Allis-Chalmers is able to offer an operating mechanism with outstanding advantages.

1 Simple — Has fewer parts than other types of operating mechanisms. Its simplicity is a measure of its reliability and ease of maintenance.

2 Unaffected by Weather — Whether it's hot or cold, the energy stored in the system provides more than the standard number of operations. Use of oil with constant viscosity over wide range of temperatures insures uniform performance.

3 No Moisture Problem — Entire system is filled with oil with inhibitor which eliminates rust and corrosion.

4 No Dirt Problem — In effect, it is a sealed system with efficient filtering to eliminate the hazard of dust and dirt.

5 Fast — In fact, it actually could be set to operate at speeds far faster than present useful speeds.

6 Emergency Closing — It can be closed at full speed onto an energized line even when no control power is available.

7 Mechanically trip-free — The simple mechanically trip-free mechanism, proven on other Allis-Chalmers high speed breakers, has been adapted to the *Pneu-Draulic* operator. A-4285

The *Pneu-Draulic* operator is now available on breakers 69 kv and above. Watch for it on other ratings.

It will be to your advantage to investigate further the *Pneu-Draulic* operator and other features of these breakers. Call your nearby A-C district office for additional information, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

Pneu-Draulic is an Allis-Chalmers trademark.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

Electrical World

Vol 142 No. 26 December 27, 1954

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ELECTRICAL WORLD

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for High Voltage Cable

be safer...

be surer

with

SHIELDED KEYSTONE-HAZAPRENE

Shielding of electrical cables at voltages over 5000 volts is now generally recommended. By equalizing voltage stresses and preventing the formation of corona, shielding guards the life of the rubber insulation. It also prevents surface discharges, thus protecting men who handle the cable.

One of the important advantages of Shielded Keystone-Hazaprene over other such cables is in the controlled application of the copper shielding tape. In Shielded Keystone-Hazaprene this tape—as well as the auxiliary paper and cable tapes—is applied with constantly controlled tension, the most successful means of preventing undesirable physical stresses within the cable. Case histories have proved the proper application of shielding tape to be a very important factor in the service life of high voltage rubber-insulated cable.

This exclusive Hazard feature, combined with the toughness of the mold-cured Hazaprene sheath and the stability of the Keystone insulation, provides a high degree of dependability, long service life and operating economy.

For transmission and distribution circuits, generator and transformer leads, test leads and similar uses, you'll use shielded cable for 5001 volts and up. And to protect personnel and vital electrical circuits, be safer and surer by specifying Shielded Keystone-Hazaprene. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pennsylvania.

HAZARD *insulated cables*

1954

10,000 FEET OF CONDUIT RODDED IN 8 HOURS!

Pick-up and Leader fittings meeting

Right, Electroline Steel Rodding Equipment feeds easily around the bends.

Below, Leader locked in Pick-up for either push or pull.

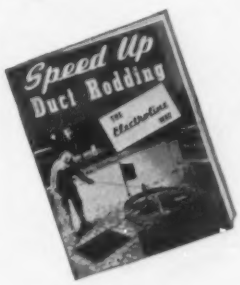
EASY DOES IT!—It's all in a day's work with Electroline Steel Duct-Rodding Equipment rodding 10,000 feet of conduit!

Light in weight, easily handled and stored, low upkeep: these are a few of the advantages utility men know to be true. But even bigger, more important advantages are—

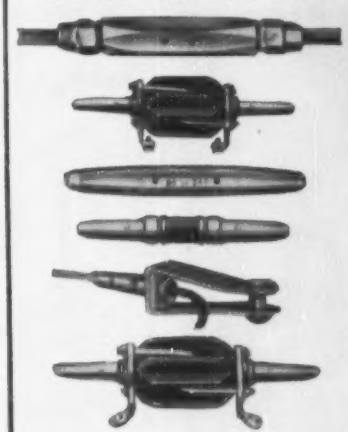
- *Savings in the cost of labor*—for example, where it formerly took two gangs from one to two weeks on a given job, one gang, *in one-half hour*, has completed the same job—using Electroline Duct-Rodding Equipment.
- *Savings in original cost*—you get long life—double that of other types—when you buy Electroline Duct-Rodding Equipment. Add to that this fact: this equipment costs just about half as much for equivalent capacity! *There's true economy.*
- *Savings in Total Investment*—fewer sets are required because of the speed with which a job is completed and the equipment moved to other locations.

Speed up installation, reduce your costs; start now to use Electroline Duct-Rodding Equipment. Available for 3", 3½" or 4" Duct.

We've got a 4-page brochure which describes and illustrates more completely how this equipment can benefit you. We'll gladly send you a copy. Write us.



OTHER *Electroline* PRODUCTS



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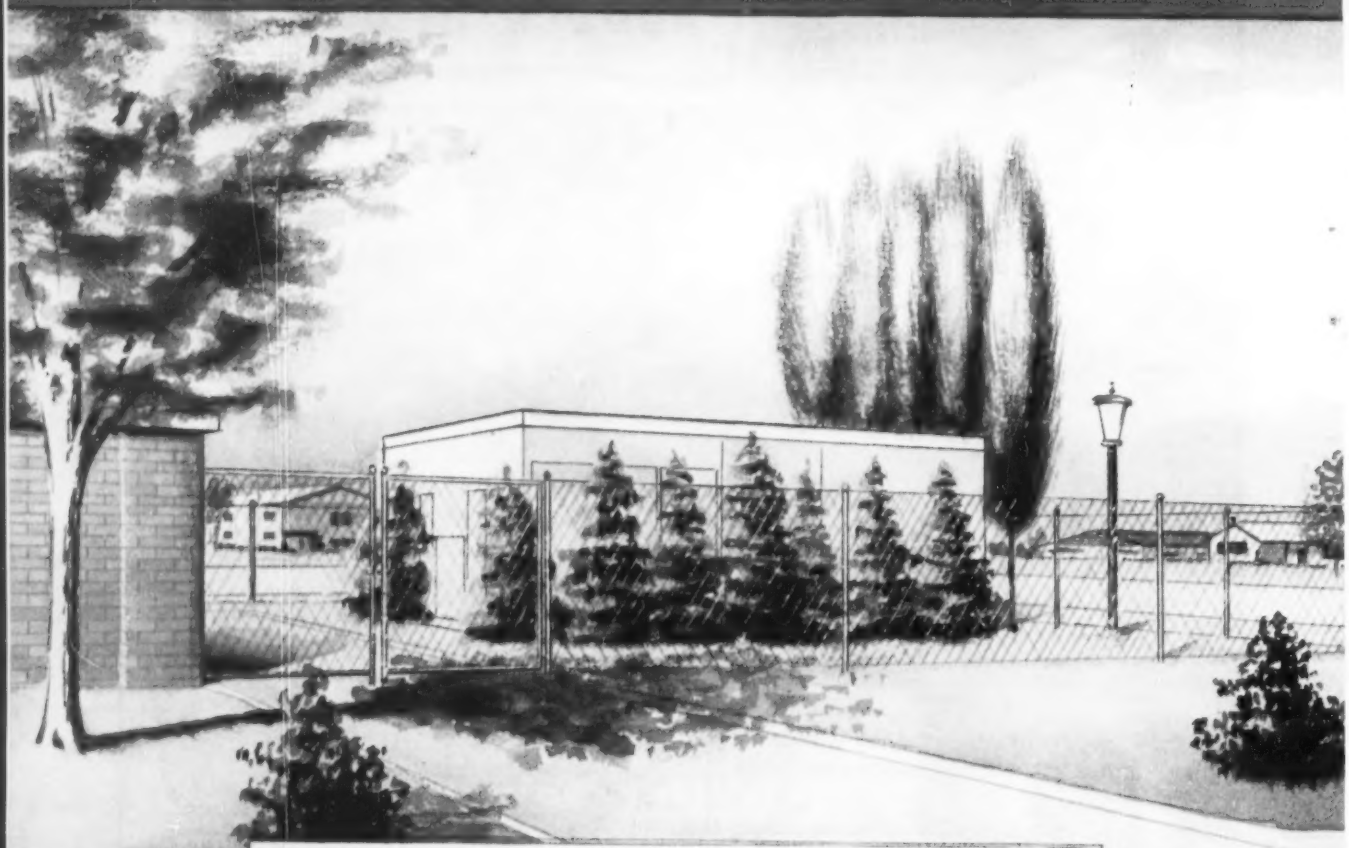
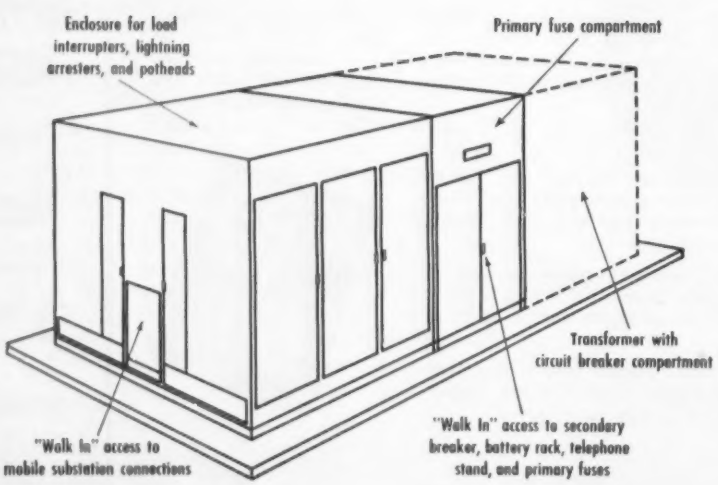
WILL YOUR NEW DISTRIBUTION SUBSTATION




Enclosure for load interrupters, lightning arresters, and potheads
Primary fuse compartment
Transformer with circuit breaker compartment
"Walk In" access to secondary breaker, battery rack, telephone stand, and primary fuses
"Walk In" access to mobile substation connections

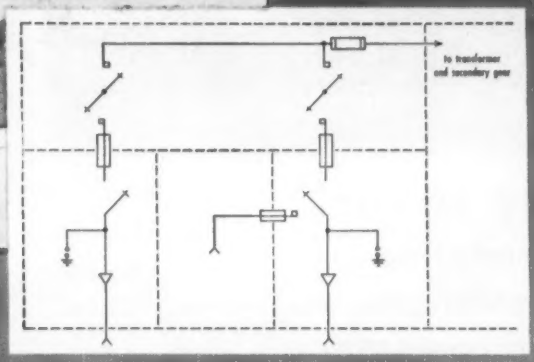
HAVE Neighborhood Acceptance?

WILL IT GIVE YOU ZONING BOARD APPROVAL?

With S&C Metalclad Primary Gear you get a compact, attractive, and *Completely* Enclosed Substation for residential areas—even when the primary service is 34.5 kv

Plus THESE EXTRA ADVANTAGES

- Tamper-free metalclad construction: High voltage is locked in . . . intruders are kept out—and safe
- Simple, *packaged* installation that saves the time and cost of piecemeal open construction
- *Reliable protection* and ability to switch under all conditions, except short circuit
- New conveniences in operating and maintenance



Circuit diagram of the S&C Metalclad Primary Gear for the distribution substation illustrated. The gear is equipped with Type SM Power Fuses and Alduti Type Load Interrupters with provision for remote control operation.

Incorporated in the unit on the left are these operating features:

1) Pothead isolation—for protection of operators during maintenance

2) Disconnecting provisions to isolate load interrupters, to by-pass entire substation, and to feed mobile substation

3) Integral housing of control panels, battery rack, work stand, telephone stand. Elimination of need for unsightly tool shacks

4) Shelter for maintenance of secondary gear

5) Unit capsuled for shipment in one piece

S&C ELECTRIC COMPANY

4421 RAVENSWOOD AVENUE
CHICAGO 40, ILLINOIS, U. S. A.

IN CANADA:
S & C ELECTRIC CANADA, LTD.
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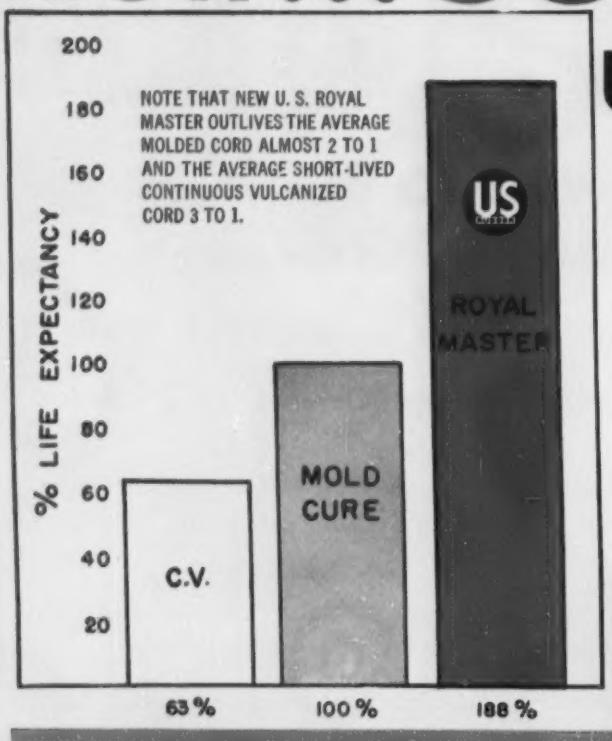
POWER FUSES • DISTRIBUTION CUTOUTS AND FUSE LINKS • LOAD INTERRUPTERS • METALCLAD SWITCHGEAR

Specialists in High-Voltage Circuit Interruption

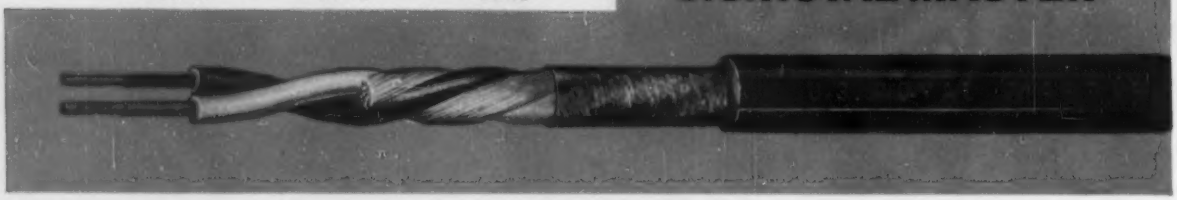
Now...88% longer U.S. ROYAL



Chart—summarizing individual service factors weighted by their contribution to overall service life—shows new U. S. Royal Master Cord gives 88% longer life than the average of competitive molded cords.

LOOK FOR THE NAME—

U.S. ROYAL MASTER



Superior on every count!*

- 33.3% greater heat resistance
- 55.7% greater impact strength
- 53.8% greater abrasion resistance
- 30.6% greater resistance to cutting
- 110.3% greater resistance to tearing
- 21.2% greater tension or breaking strength
- 23.3% greater oil resistance
- 128.8% greater flexibility

*to the average of molded cords of other makes

US RUBBER

UNITED STATES

ELECTRICAL WIRE AND CABLE DEPARTMENT

cord life—with NEW MASTER portable cord!

Far outlasts *any* other cord made!

Service to cost ratings show new U. S. Royal Master Cord actually gives $1.88 in value for every cord dollar when compared to the average competitive molded cord!

Two years ago, "U. S." engineers began a *complete reexamination* of portable cord construction, service life, and the causes of cord failure.

Over 10,000 tests were made. More than a thousand cords of all leading makes, including our own famous U. S. Royal Cord, were analyzed, tested, and compared.

Every life factor was considered and carefully evaluated, alone and in its relation to overall cord performance and service life.

Backed by 64 years of experience in the manufacture of electrical wire and cable, U. S. Rubber engineers then translated their findings into an entirely new portable cord, designed to surpass any other previously made.

Extensive tests, both in the laboratory and in outside plant installations have proved this new portable cord startlingly superior in every respect!

New U. S. Royal Master is unquestionably the finest cord you can buy!

From every standpoint, new U. S. Royal Master is a finer, more durable cord — actually gives 88% longer life than the average of other molded cords — far longer than *any* other cord — surpassing even a *hypothetical* cord incorporating the best features of all those tested!

Far greater value, too! In spite of almost doubled service life, this great new cord is in the same price category as other molded cords—giving you $1.88 in cord value for every cord $1.00!

Prove to yourself the outstanding superiority of new U. S. Royal Master Portable Cord—in both service life *and* economy! Get in touch with your "U. S." distributor today!

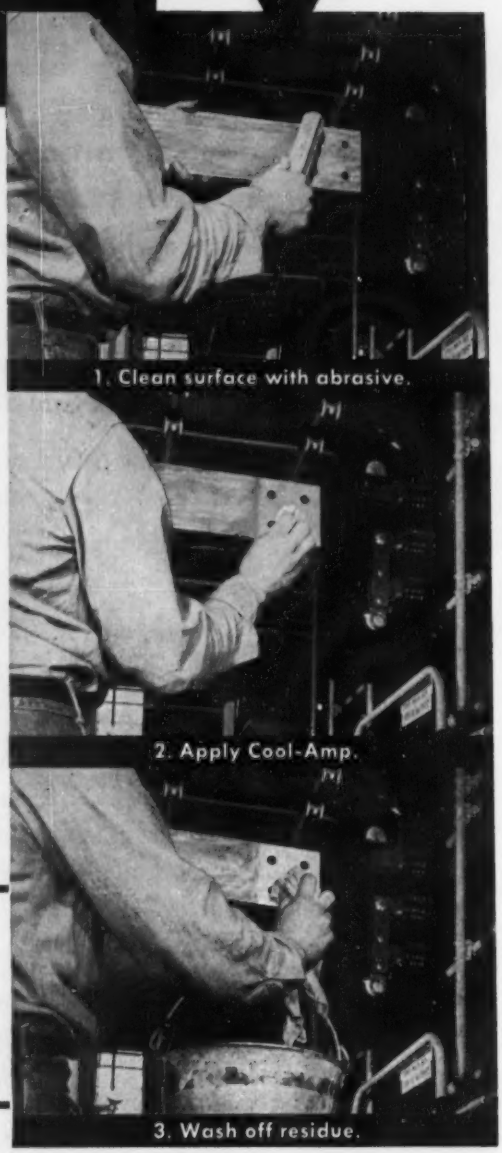
Approved by Underwriters' Laboratories, Inc.

RUBBER COMPANY

ROCKEFELLER CENTER, NEW YORK 20, N. Y.

SILVER PLATING "ON THE JOB" WITH POWDER

3 Easy Steps



A convenient, economical, and thorough silver-plating compound designed to silver-plate high amperage connections on the job.

Cool-Amp silver-plating powder prevents oxidation and eliminates over-heating, providing cool, maximum conductivity for copper, brass or bronze contacts.

A genuine, permanent coat of silver is deposited that will not peel off. Cool-Amp can be used on inside or outside installations. Always ready for use, it can be readily carried in tool boxes. The only other equipment needed to silver-plate "on the job" with Cool-Amp is a wire brush or abrasive cloth, a clean rag and water. It is completely harmless to the user and can be applied without rubber gloves or masks. One pound will silver-plate approximately 6,000 square inches.

Cool-Amp is a proven product which is now being used by many of the nation's leading public utilities and manufacturing firms.

Order a trial pound. $13.50 per pound, shipped prepaid. Quantity discounts. Or, send coupon below for a free sample.

Please send a free sample of COOL-AMP to:

Name_____

Address_____

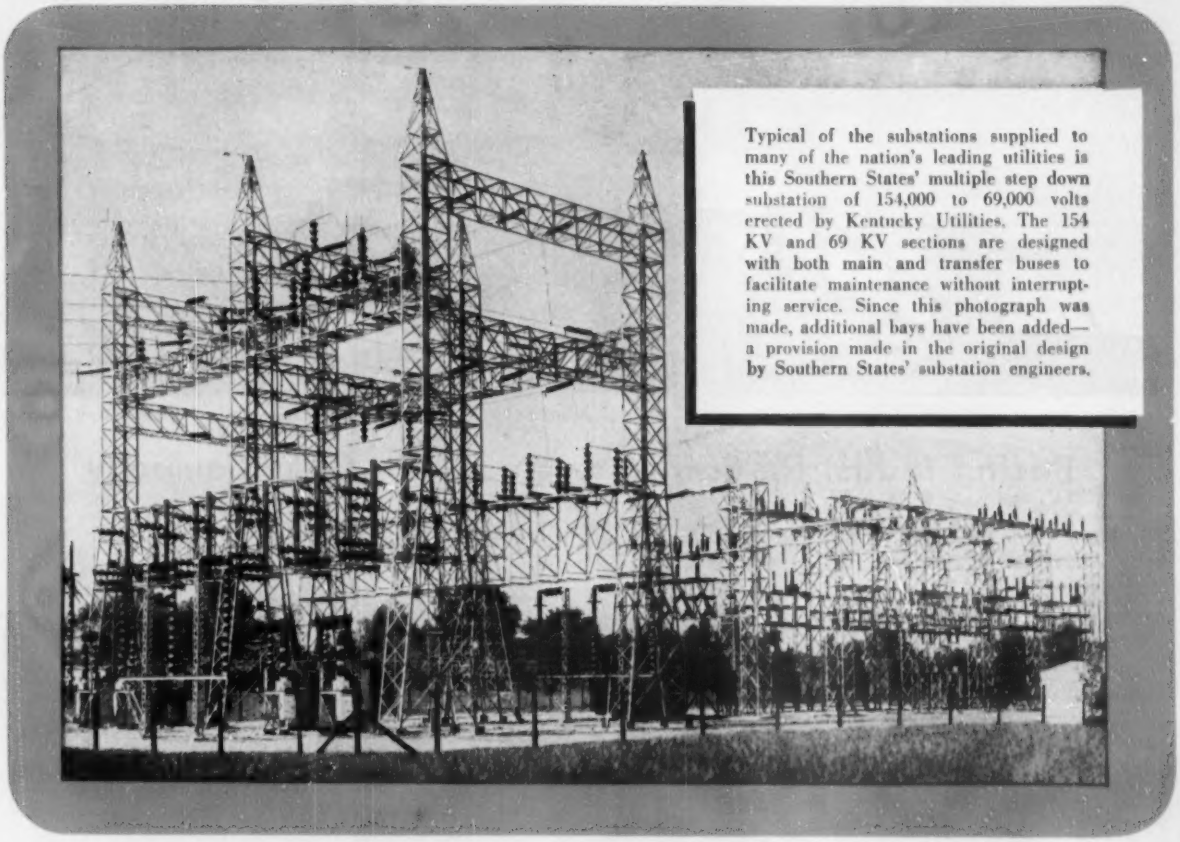
City_____ State_____

Firm Name_____

$13.50 per pound. **Shipped prepaid.**

COOL-AMP

Dept. EW-1, 8603 S. W. 17th Ave. • Portland, Oregon



Typical of the substations supplied to many of the nation's leading utilities is this Southern States' multiple step down substation of 154,000 to 69,000 volts erected by Kentucky Utilities. The 154 KV and 69 KV sections are designed with both main and transfer buses to facilitate maintenance without interrupting service. Since this photograph was made, additional bays have been added—a provision made in the original design by Southern States' substation engineers.

HOW KENTUCKY UTILITIES SAVED TIME AND MONEY ON THIS SUBSTATION

When Kentucky Utilities decided to erect a multiple feeder step down substation at Paducah, Kentucky, it was as simple as one, two, three to get exactly what was needed.

One—a single-line wiring diagram and plat was sent to Southern States; *Two*—our engineers went to work and developed a design for a station that would meet immediate requirements, provide for future bays, and at the same time utilize many standard components which would result in substantial savings of both time and money; *Three*—when final plans were approved, Southern States took care of engineering, production schedules and supplied the steel structure, airbreak switches, disconnects and bus supports.

The result: an efficient, functional substation erected at great savings in time and money to Kentucky Utilities. Once more Southern States' single responsibility service in the design and production of transmission and distribution substations paid off for this progressive utility.

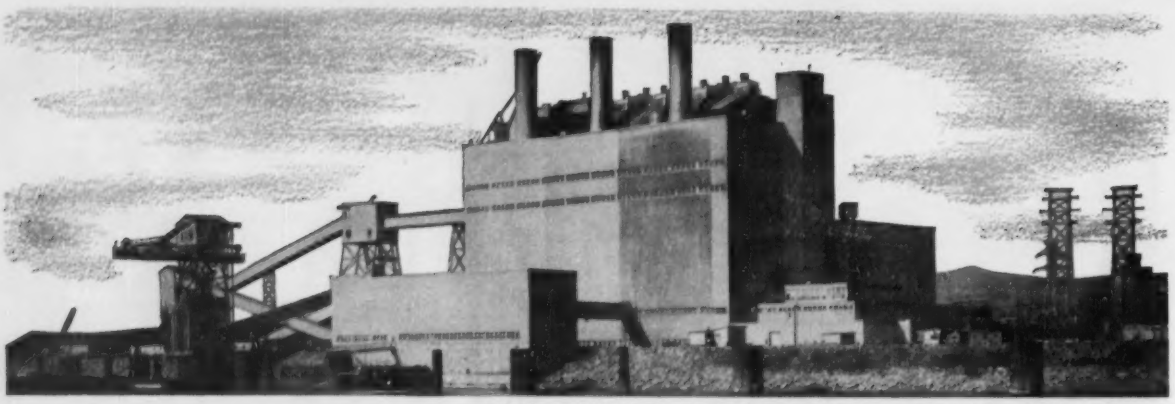
Your company can profit by this experience. Get full facts about this complete "3-Step Plan" from your Southern States' representative, or write direct.

SS

SOUTHERN STATES EQUIPMENT CORP.

HAMPTON, GEORGIA

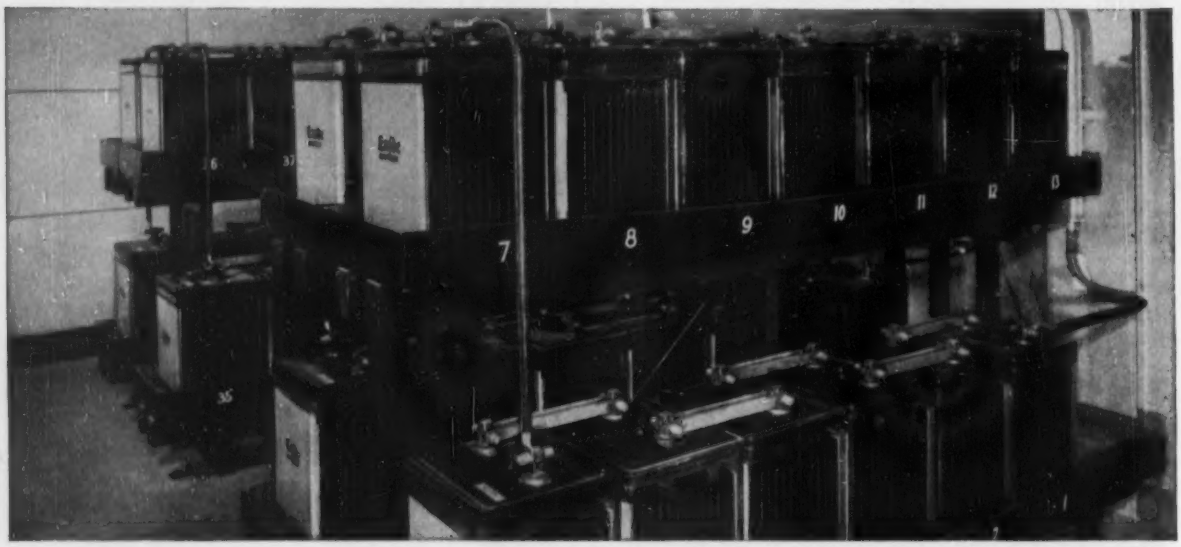
IN CANADA: Dominion Cutout Co., Ltd., Toronto



Modern, efficient and packed with power—the Elrama plant of Duquesne Light Company.

Pacing Industrial Progress—*Duquesne Light Company*

Exide®-Manchex® BATTERIES



Exide-Manchex FME-25 battery installation at the Elrama station.

Although Pittsburgh's electricity needs will continue to grow, Duquesne Light Company's newest power station will be a vital factor in meeting today's as well as future demands for electrical power. The Elrama plant, located on the Monongahela River, is the fifth in the Duquesne system. It has two 95,000-kilowatt units now in operation, with a third unit of 120,000-kilowatt capacity scheduled for completion in 1954. Duquesne Light Company's present expansion program will have added 91 per cent as much generating capacity as was installed in the 70 previous years of the company's history.

It is significant that Duquesne employs Exide-Manchex batteries; they assure:

POSITIVE OPERATION: Dependable performance at ample voltage avoids switchgear operational failures.

INSTANTANEOUS POWER: High rates for switchgear and valve operation with adequate reserve power for all other control circuits and for emergency lighting.

LOW OPERATING COST: Extremely low internal resistance.

LOW MAINTENANCE COSTS: Water required about twice a year. No change of chemical solution during life of battery.

LOW DEPRECIATION: Sturdy, long-life construction.

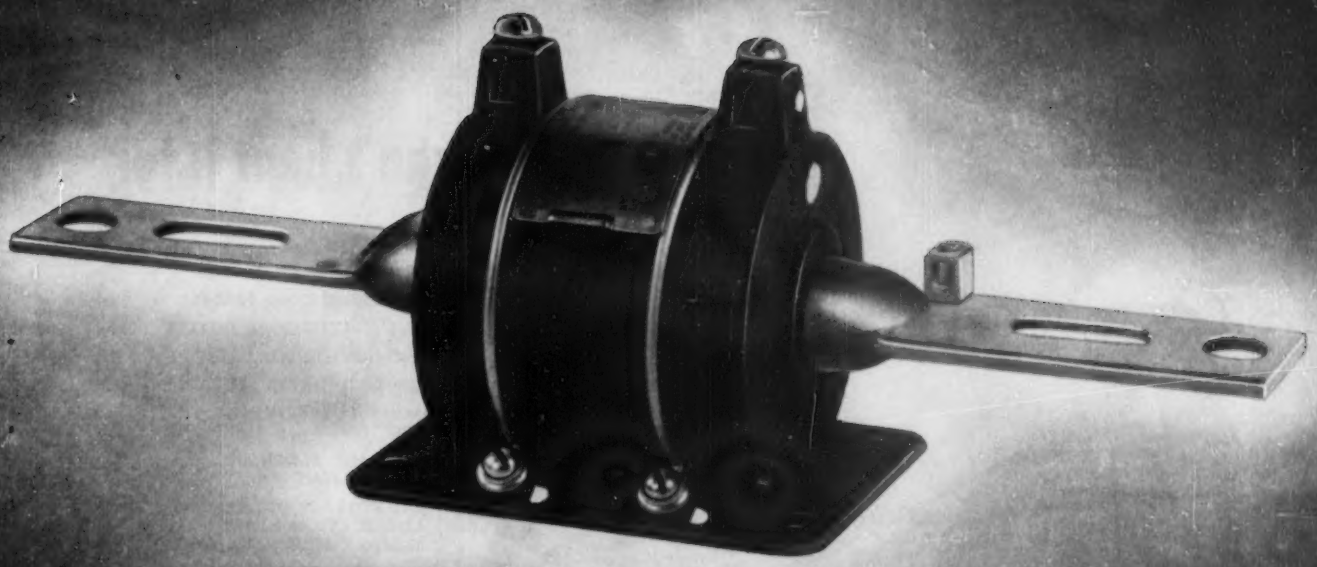
GREATER CAPACITY in a given amount of space avoids overcrowding.

• • •

Various sizes and types of Exide Batteries are available in plastic containers.

Exide-Manchex is your best battery buy for all control and substation services.

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.



THE NEW G-E MINIATURE TRANSFORMER measures only 3½" long by 3 3/16" wide by 4 1/16" high without bar-primary, and weighs from 2 to 4½ pounds. It is available in ratings of 200 and 400 amperes.

GENERAL ELECTRIC ANNOUNCES . . .

New Butyl-molded Miniature Current Transformer

General Electric's butyl-molded current transformer line has been extended to include a 600-volt miniature. The new Type JCA-0 features complete mounting flexibility. Designed for indoor or outdoor metering applications, the new miniature is available in 200- and 400-ampere ratings in both bar-primary and window-type construction.

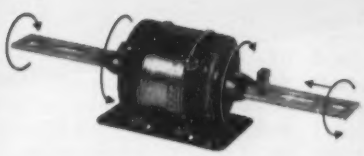
MOUNTING FLEXIBILITY is provided in the Type JCA-0 first by friction-fit primary terminals. These terminals are adjustable within a 360-degree arc and can also be moved lengthwise. Also the removable base plate can be rotated within an arc of 180-degrees in relation to the secondary terminals.

INDOOR OR OUTDOOR APPLICATION is another feature of the Type JCA-0. Because of its butyl-molded construction, this new transformer can be installed either indoors or outdoors, and requires no housing or other protection from the weather.

SIX VARIATIONS of this butyl-molded current transformer are possible. It can be used as a bar-primary-type or window-type, or with or without base plate and an auxiliary mounting plate.

FOR MORE INFORMATION, contact your nearest G-E Apparatus representative, or write for bulletin GEC-1245 to: Section 604-41, General Electric, Schenectady 5, N. Y.

GENERAL ELECTRIC



BAR-PRIMARY-TYPE

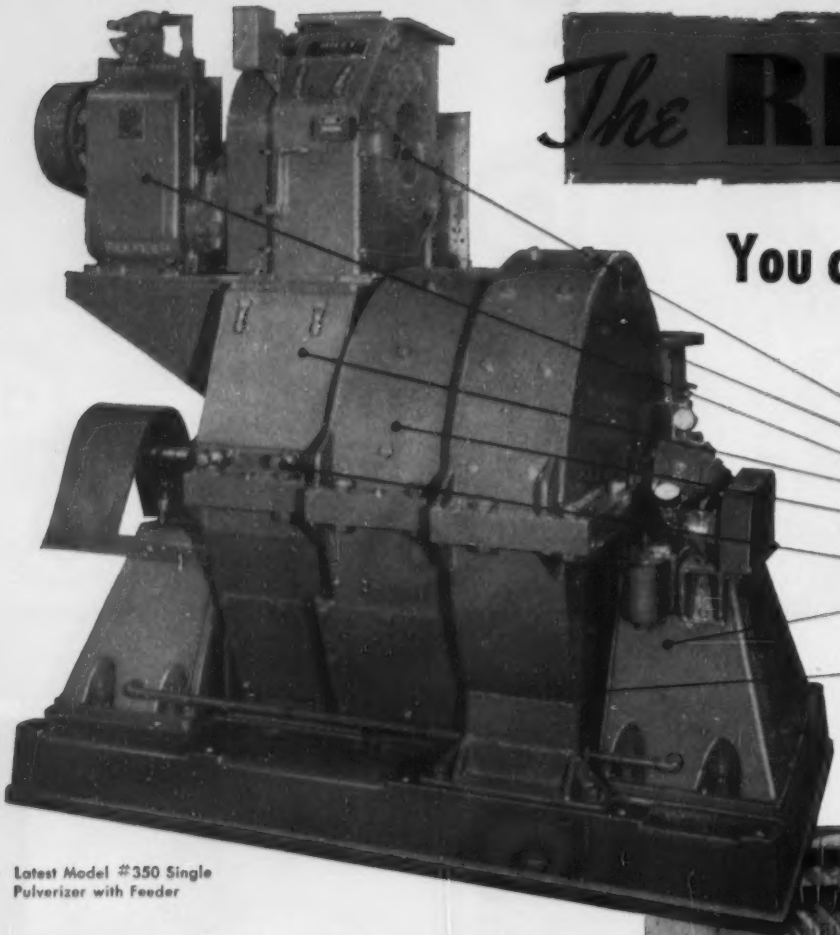
Complete adjustability is available in the new transformer. The primary and secondary terminals may be adjusted and set independently of each other. This flexibility provides mounting in any position.

WINDOW-TYPE

The new Type JCA-0 transformer is also available in a window-type construction for through-type applications. This feature plus the butyl-molded construction facilitates outdoor pole mounting installations.

The RILEY

You can't beat it for



- METERING COAL FEEDER*
- PULVERIZED COAL OUTLET
- VARIABLE SPEED DRIVE
- CRUSHER-DRYER SECTION
- MAIN PULVERIZING SECTION
- CRUSHER BLOCK ADJUSTMENT
- OIL STORAGE FOR BEARING LUBRICATION SYSTEM IS INSIDE THE PEDESTAL
- PULVERIZER SECTIONS ARE MOUNTED INDEPENDENT OF BEARING PEDESTALS

*Can be provided mounted on pulverizer, or separately on floor above.

Latest Model #350 Single Pulverizer with Feeder

Riley has manufactured coal pulverizers since 1925. In 1950 the Riley "50" Pulverizer Series was introduced. Tough, durable Tungsten Carbide applied to pulverizing parts provides extra long continuity of service and low maintenance even with high ash coals. In addition, a crusher-dryer section precrushes the coal, rejects foreign material, and flash-dries the wettest coals, with the result capacity is maintained. Illustration at right shows moving pegs and the pulverizer's accessibility.

#550 Duplex Leaves Riley's Detroit Plant for Colorado

The #550 Duplex, the largest model, is actually a combination of two #550 Single Pulverizers and has a 46,000 lbs/hr rated capacity with 50 grindability coal. Public Service Co. of Colorado has installed seven of these units. Detroit Edison Company has ordered six Duplex Units for a steam generating unit with a capacity of two million pounds per hour.

Cross section of typical #550 Duplex Pulverizer. Coal enters crusher-dryer section (at ends) — here it is precrushed, flash-dried and tramp iron is rejected. Coal is pulverized to required fineness in second sections by attrition. Coal, uniformly mixed with air is blown to burners (center sections).

RILEY DESIGNS, MANUFACTURES AND INSTALLS COMPLETE STEAM GENERATING UNITS AND

"50" PULVERIZER

quiet, safe, dependable, economical operation!

THESE ADVANTAGES *SOLD* THESE PUBLIC UTILITIES

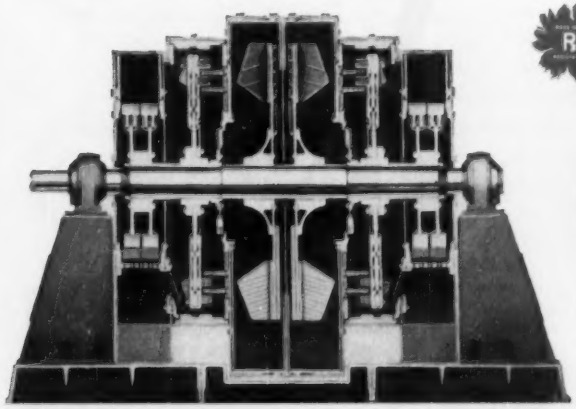
- Tungsten carbide faced pulverizing parts
- No metal to metal contact
- Quiet, vibrationless operation
- Small, overall space
- Low foundation cost
- No loss of capacity with wet coal
- Extreme load range
- Insignificant Btu loss with rejections
- Insignificant handling cost of rejections
- Ease of maintenance
- No adjustments required to maintain fineness
- Low cost maintenance with high ash coals
- Ability to use high primary air temperature with increase in efficiency
- Minimum of lubricating difficulty
- Ease of automatic regulation
- No auxiliary air required for sealing
- Minimum explosion and fire hazard
- Rapid response to load change

*Public Service Co. of Colorado	7-550	Duplex
	1-450	Single
	1-350	Single
*Detroit Edison Co.	7-550	Duplex
Columbus & Southern Ohio Elec. Co.	4-550	Duplex
*Hartford Electric Light Co.	4-550	Duplex
Potomac Edison Co.	3-550	Duplex
Monongahela Power Co.	3-550	Duplex
Northern States Power Co.	3-550	Single
Iowa Electric Light & Power Co.	9-550	Single
Taiwan Power Co.	3-550	Single
Superior Water, Light & Power Co.	2-450	Single
Upper Peninsula Generating Co.	2-550	Single
Utah Power & Light Co.	4-550	Single
Western Colorado Power Co.	2-350	Single

... and these public power stations

Dairyland Power Co-op., Alma, Wis.	3-550	Single
City of Owensboro, Kentucky	3-550	Single
City of Richmond, Indiana	3-550	Single
South Carolina Public Serv. Auth.	6-550	Single
Corn Belt Power Co-op.	2-550	Single
City of Austin, Minn.	2-550	Single
City of Rochester, Minn.	2-550	Single
City of Holyoke, Mass.	2-450	Single

**Pulverizers with Steam Generating Units other than Riley's.*



A survey of your plant by a consulting engineer could show ways of making surprising savings in your power costs.

RILEY

Stoker Corporation

WORCESTER, MASSACHUSETTS

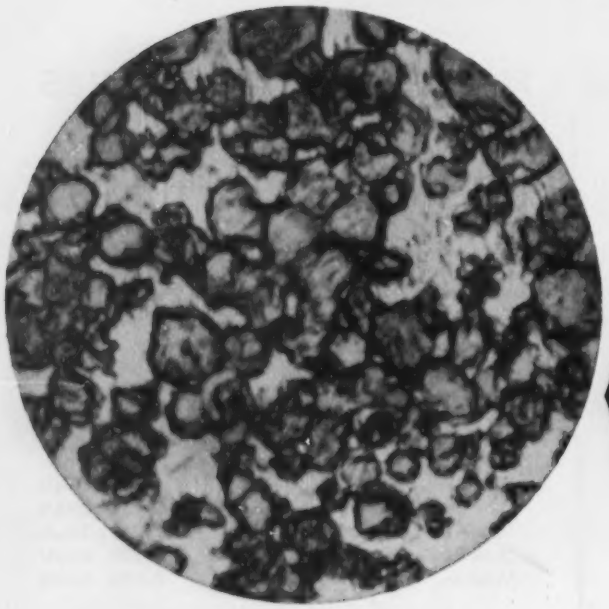
Boston, New York, Philadelphia, Buffalo, Washington, Pittsburgh, Cleveland, Detroit, Chicago, Cincinnati, Charlotte, New Orleans, Atlanta, St. Louis, Kansas City, St. Paul, Tulsa, Houston, Denver, Salt Lake City, Los Angeles, San Francisco, Portland, Seattle.

FUEL BURNING EQUIPMENT FOR PUBLIC UTILITY AND INDUSTRIAL POWER AND HEATING PLANTS

Close-Up Of A Reason Why

ELKONITE® Contacts

Have No Equal



Here, magnified over two thousand times, is one of the reasons why Elkonite contacts give such long, dependable service in heavy-duty power-interrupting equipment.

This photomicrograph illustrates the type of structure found in copper Elkonite. Note the even distribution, and how the copper (white area) fills the interstices of a sintered tungsten (dark area) compact.

The unique Elkonite process, developed by Mallory, combines metals which will not alloy. The arc-resistance of refractory metals, such as tungsten, molybdenum or their carbides, is merged with the high current-carrying ability of copper or silver.

Thus Elkonite contacts offer the designer an unequalled combination of good conductivity, impact strength and hardness, and resistance to arc erosion and sticking. They withstand severe short-circuit arcing conditions, and are the accepted standard for interruption of heavy duty arcing loads.

A wide selection of Elkonite contact materials is available to suit the exact requirements of your own product design. For complete technical data, write today for a copy of the new Mallory Contact Catalog.

ELKON® BRONZE for contact backing

As a backing material for contacts in switchgear and other heavy-duty applications, Elkon Bronze offers advantageous characteristics. One of a line of Mallory alloys developed for contact backing, Elkon is a copper base material containing 1.5 to 2.0% nickel, 0.35 to 0.60% silicon and 0.1 to 0.3% manganese.

Ultimate tensile strength	50,000 psi
Hardness (Rockwell B scale)	75
Elongation	10%
Electrical conductivity	35% IACS

Elkon Bronze is available in finished or rough castings to your specifications. Write for information.

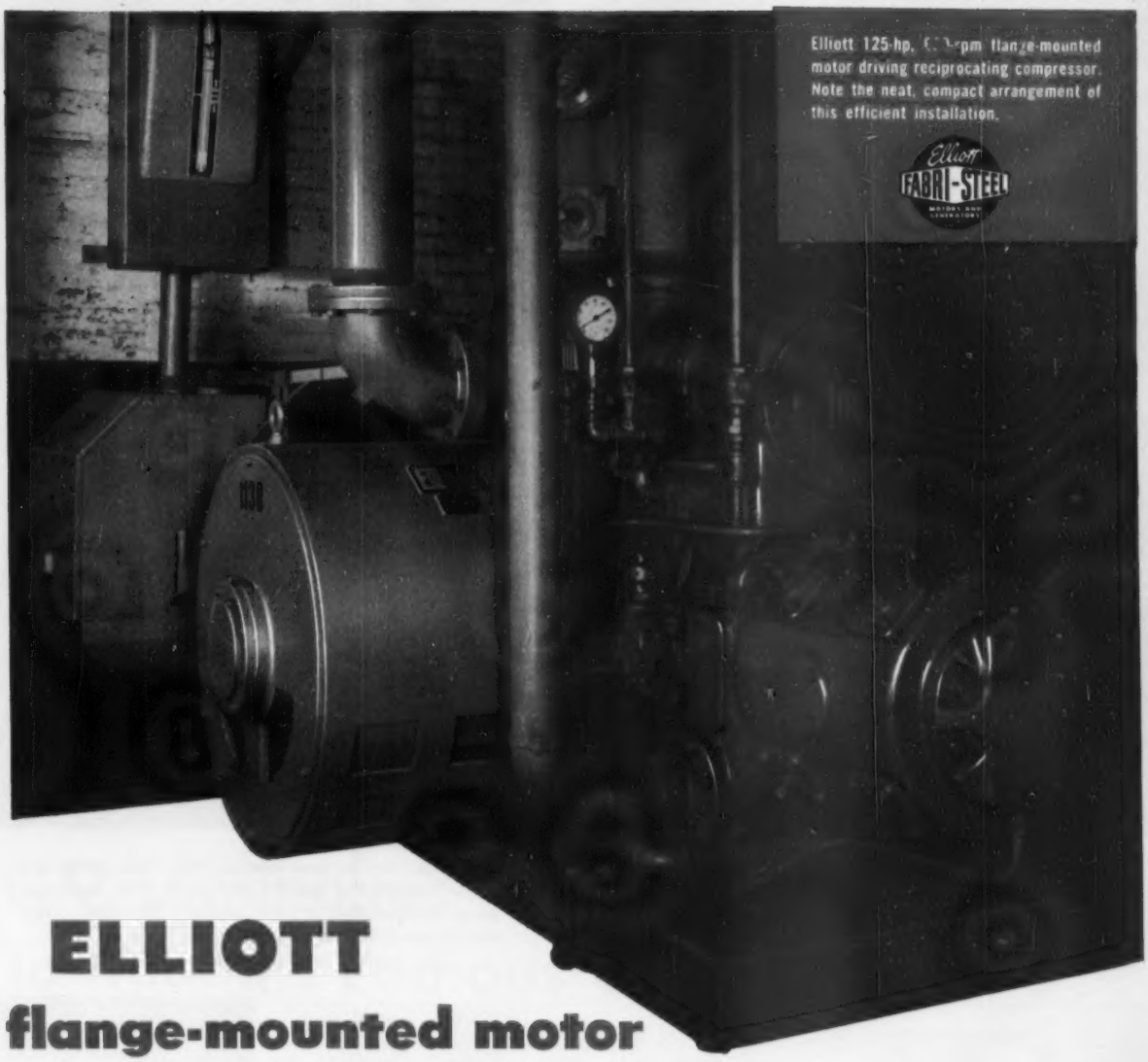
Serving Industry with These Products:

Electromechanical—Resistors • Switches • Television Tuners • Vibrators
Electrochemical—Capacitors • Rectifiers • Mercury Batteries
Metallurgical—Contacts • Special Metals and Ceramics • Welding Materials

P. R. MALLORY & CO. Inc.

MALLORY

P. R. MALLORY & CO., Inc., INDIANAPOLIS 6, INDIANA



Elliott 125-hp, [illegible]-rpm flange-mounted motor driving reciprocating compressor. Note the neat, compact arrangement of this efficient installation.

Elliott FABRI-STEEL

ELLIOTT
flange-mounted motor for reciprocating compressors

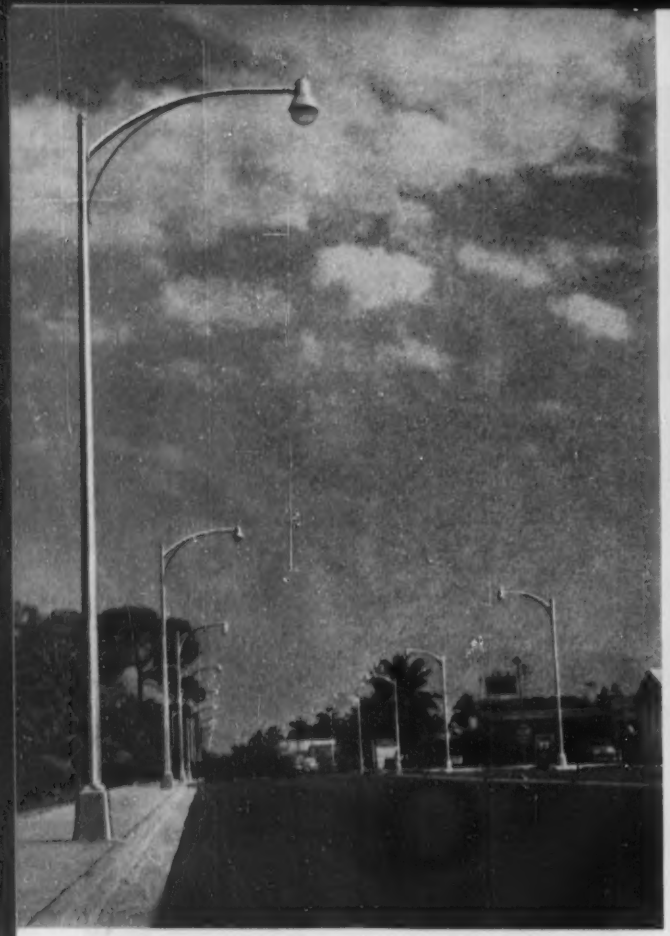
COMPACTNESS AND ECONOMY of installation makes this motor-driven compressor unit a neat "package" on any floor. The Elliott motor, a vital element in this unit, requires a minimum of space with the motor stator mounted on a flange bracket on the side of the compressor frame and the motor rotor mounted directly on an extension of the compressor shaft. Elliott motors are available for this type of installation as squirrel-cage induction motors and either unity powerfactor or .8 PF leading synchronous motors in ratings of 125 and 150 hp at 600 rpm and 200 and 250 hp at 514 rpm.

Excellent design and careful workmanship make this Elliott motor a worthy teammate for your compressor. Insulation, the key to long motor life, is given very special attention. The finest materials are selected, and they are applied by experienced craftsmen. In addition, Elliott will supply any make of control requested and *provide a completely coordinated motor, control and exciter combination.* For complete technical details, write Elliott Company, Ridgway Division, Ridgway, Pa.

ELLIOTT Company

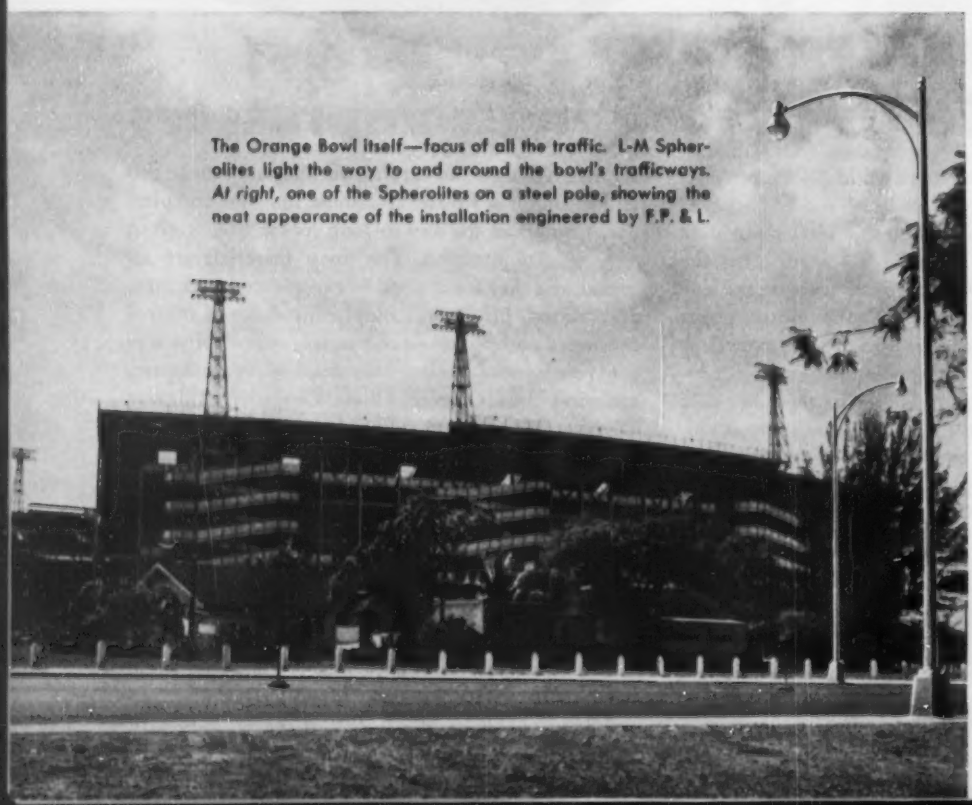
R4-16

TURBINE-GENERATORS TURBINES MOTORS GENERATORS DEAERATING HEATERS EJECTORS CONDENSERS COMPRESSORS TURBOCHARGERS TUBE CLEANERS STRAINERS

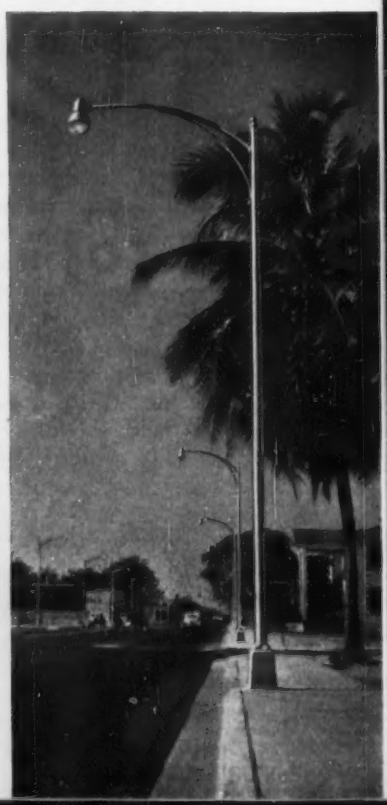


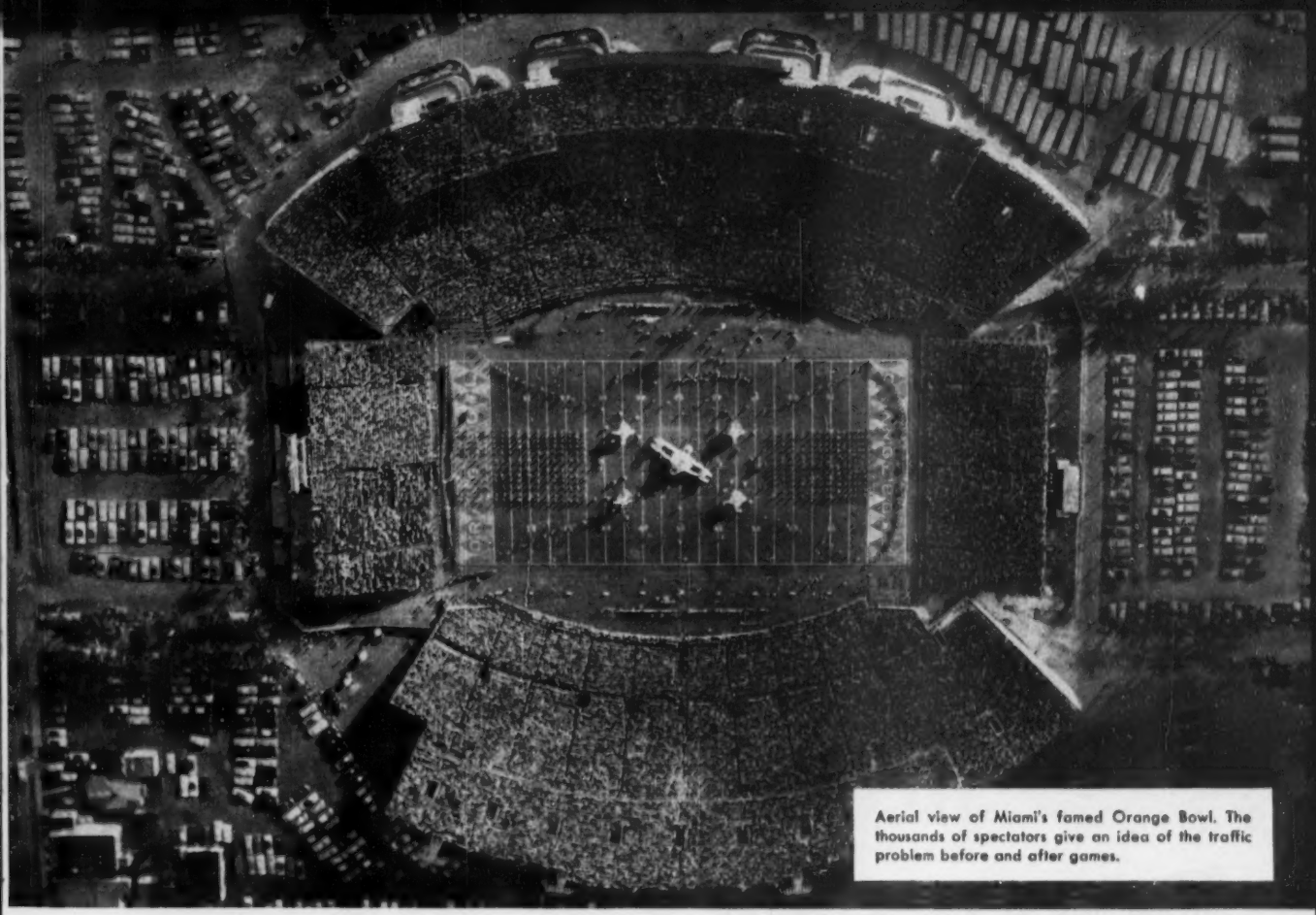
North West Seventh Street, leading to the famed Orange Bowl. Normally a heavily travelled thoroughfare, the highway is jammed with cars on game days and evenings. Fast, safe handling of traffic becomes a vital consideration.

Night view from the same location. Well diffused lighting of ample intensity was installed by Florida Power & Light to permit fast movement of traffic consistent with traffic safety. Light is directed at the highway by L-M Spherolites.



The Orange Bowl itself—focus of all the traffic. L-M Spherolites light the way to and around the bowl's trafficways. *At right*, one of the Spherolites on a steel pole, showing the neat appearance of the installation engineered by F.P. & L.





Aerial view of Miami's famed Orange Bowl. The thousands of spectators give an idea of the traffic problem before and after games.

L-M Luminaires Light The Way To Miami's Famous Orange Bowl

Florida Power & Light Company engineers modern installations to provide cities like Miami with better lighting at lower operating and maintenance costs.

Miami's fabulous Orange Bowl has pin-pointed the Magic City's growing traffic problem. Doubling in permanent population since World War II, Miami is also host to tens of thousands more in the fall and winter seasons.

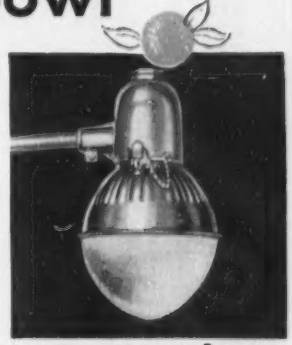
On football nights when the University of Miami Hurricanes play before 30,000 to 50,000 fans, for the magnificent New Year night pageantry, and for the many night high school football games, North West Seventh Street, Miami's newest white way leading to the glittering Bowl, is jammed from curb to curb with traffic.

To meet this critical traffic problem, the thoroughfare was recently equipped with L-M luminaires of 10,000 lumens each and was widened and repaved. Light standards are spaced at 65-foot staggered intervals for almost three miles. Result: traffic flow has been *speeded greatly and safely*, a tribute to sound engineering and planning.

Florida Power & Light Company finds that the installation of modern units such as L-M provides has greatly reduced repair-crew time and replacement cost. With 17,700 street lights in Miami to service, the company can now keep the city better lighted and its crews can cover more territory. Florida Power & Light recently engineered a similar white way installation at Fort Lauderdale, where L-M supplied the 235 luminaires.

The new L-M Spherolites® on Seventh St. were selected because they give maximum light up and down the street, yet provide broad, even areas of illumination. This better lighting increases safety and thus speeds up traffic and helps ease the overloaded traffic conditions.

For details of these and other L-M luminaires, ask the L-M Field Engineer for information, or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).



L-M's famous Spherolite® provides highly efficient lighting, wide choice of light patterns, for incandescent lamps up to 575 watts on multiple circuits, 10,000 lumens on series circuits. L-M also manufactures the most advanced equipment for mercury vapor and fluorescent street lighting, the economical new Uni-Ballast system for *series* mercury vapor, and the famous CW ballast for *multiple* mercury vapor. Also available: L-M Street Lighting Application Recommendation Service, to help you get best results from your street lighting.

"Uni-Ballast" is a Line Material Company trademark.

213

LINE MATERIAL Street Lighting

No utility has ever "bought" a Watthour Meter

You see, to our way of thinking, a utility does not "buy" watthour meters—it invests in them. Watthour meters are the instruments through which an electric power company's revenue is determined. Don't you agree that purchasing them is really an investment . . . an outlay of capital with the view of obtaining an income or profit?

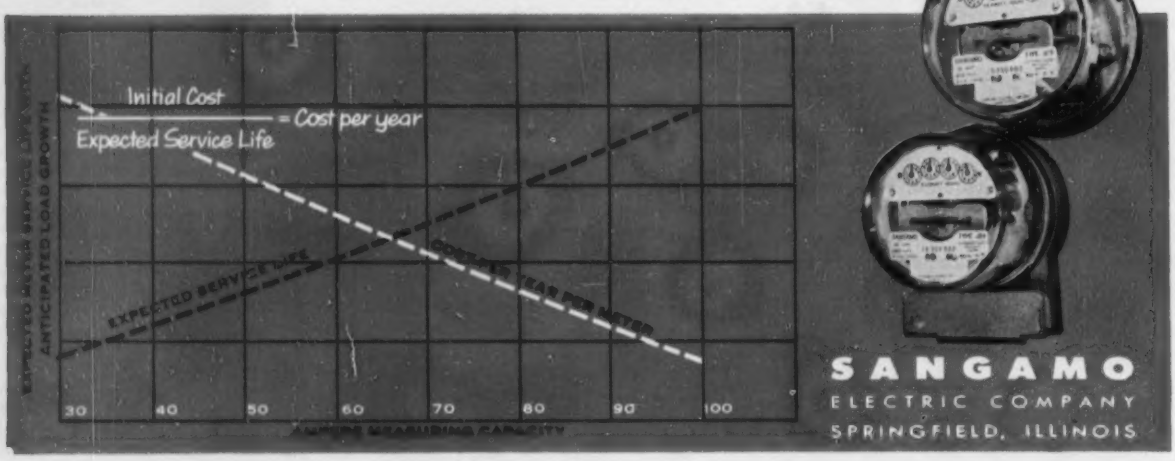
Over two hundred utilities with more than 25,000 customers on their lines have *invested* in nearly ¾ million J2 Meters since last March.

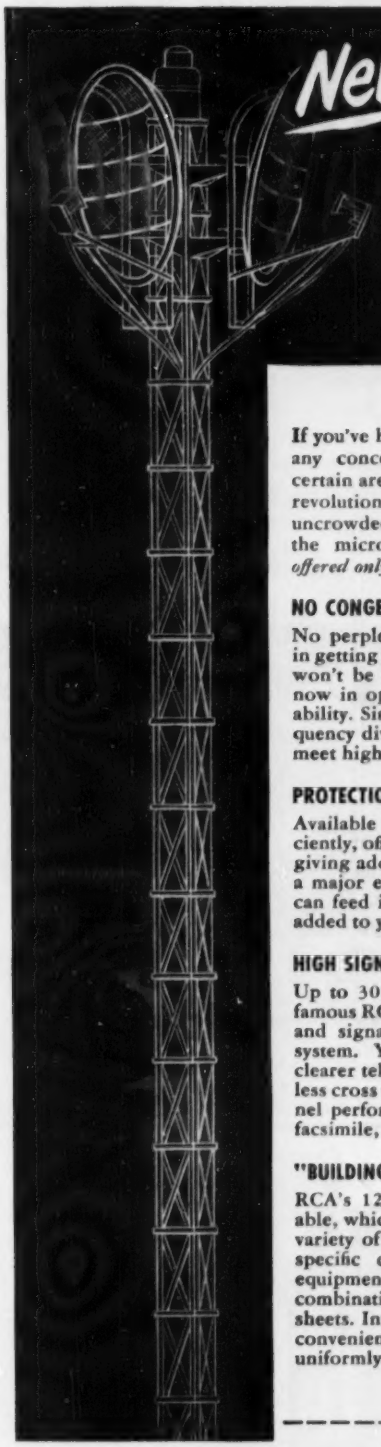
And their investments are protected because the J2 was designed specifically *to meet any future load growth.* If you divide the many years of service you can expect from a J2 Meter into its initial cost, the J2's cost per year is very low.

So when it comes to meters, choose the Sangamo J2 Watthour Meter, the first and finest 15 ampere meter with 100 ampere capacity . . . the meter that protects your investment in metering and lowers investment costs.

the FIRST watthour meter with straight line accuracy up to 100 amperes!

JM54-11





New CONGESTION-FREE MICROWAVE SYSTEM

Now offered You by RCA for the Uncrowded 2450-2700 mc Band

If you've hesitated about Microwave because of any concern about spectrum congestion in certain areas, you'll welcome news about RCA's revolutionary MM-26. First to operate in the uncrowded 2450-2700 megacycle portion of the microwave spectrum, this new system, *offered only by RCA* means:

NO CONGESTION—PEAK DEPENDABILITY

No perplexing engineering problems to solve in getting your system oriented. And your system won't be subject to interference from systems now in operation, thus providing all-time reliability. Single side band suppressed carrier frequency division multiplex is used exclusively to meet highest standards of dependability.

PROTECTION AGAINST OBSOLESCENCE

Available frequency space is utilized most efficiently, offering more systems in one band, thus giving added protection against obsolescence—a major economic advantage. The new system can feed into existing RCA systems and so be added to your present equipment.

HIGH SIGNAL-TO-NOISE RATIO

Up to 30 high-performance voice channels of famous RCA quality, or several hundred teletype and signalling channels are provided in one system. You get high signal-to-noise ratio, clearer telephone conversations, less distortion, less cross talk. You can expect better voice channel performance, dependable telemetering and facsimile, all-weather performance.

"BUILDING-BLOCK" ADAPTABILITY

RCA's 12 basic units are readily interchangeable, which means you can put together a wide variety of stations, each designed to provide a specific combination of facilities. You get equipment exactly to your specifications, each combination being clearly explained on catalog sheets. Integrated operation of all units assures convenience and versatility in system planning, uniformly high performance.

EASY INSTALLATION—SERVICING

Conventional triode tubes, unregulated power supply, familiar circuits, obviate the need for specially trained personnel. Tuning is simplified because the frequency is controlled from the terminal through the entire system.

Microwave is today's most modern form of radio for private communications systems. A radio beam carries communications and control signals from one place to another, following a narrow line-of-sight path. RCA was one of the first to pioneer in Microwave. Today its installations cover the nation and the globe. Only RCA systems provide so many advanced engineering features. Microwave specialists will be glad to answer any questions and plan your installation. Mail Coupon below for further particulars.

New stylized racks with doors feature modern functionalized design and open back for ease of servicing. Open cabinet shows complete Microwave Terminal. Closed rack shows stand-by equipment.

RCA

RADIO CORPORATION of AMERICA

COMMUNICATIONS EQUIPMENT
CAMDEN, N. J.

Radio Corporation of America
Communications Equipment
Department L-45, Building 15-1, Camden, N. J.

Please send me new booklet on RCA MM-26 Microwave—a system for the uncrowded 2450-2700 mc band, designed for pipelines, utilities, railroads, turnpike, common carrier.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

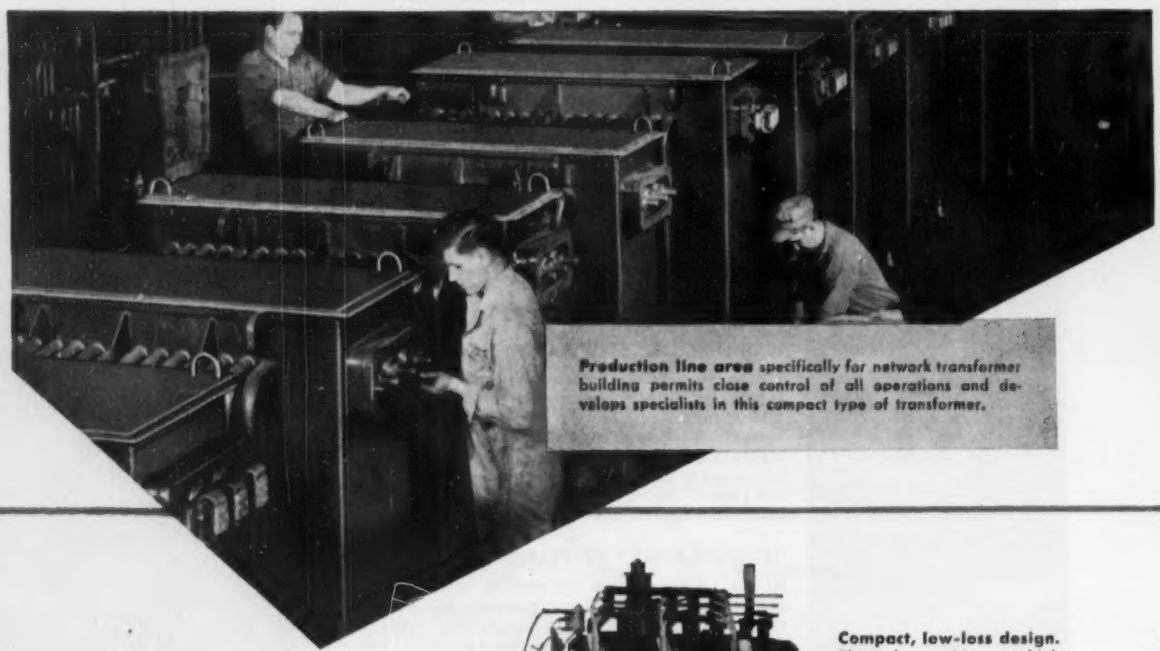
☐ Have an RCA Representative get in touch with me.

Network Choice for

Cincinnati Gas and Electric Company has had plenty of opportunity to test the design and construction features of Allis-Chalmers network transformers. Allis-Chalmers has supplied a large part of Cincinnati's downtown network needs. Excellent operating records reflect the dependability of these units.

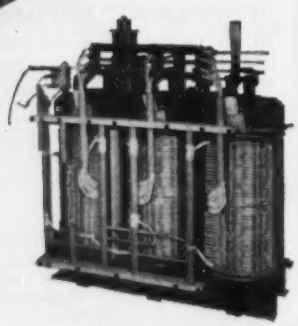
Recently two new Allis-Chalmers 1000-kva network transformers were added to the system to provide power for Cincinnati Gas and Electric's new downtown office building. These transformers are designed to meet the problem of flooding, in addition to normally rugged underground operating conditions. Thorough undercoating of tubes and surfaces in base areas with a special compound protects against extreme corrosion.

Over 1¼ million kva of these units are in operation across the country. On-the-job experience has proved their economical operation. Get more information about them by calling your nearby Allis-Chalmers district office. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for bulletin on Network Transformers. A-4263



Production line area specifically for network transformer building permits close control of all operations and develops specialists in this compact type of transformer.

Allis-Chalmers Design and Construction Features Prove Their Value in Operation



Compact, low-loss design. Thermal capacities are high even for severe load conditions. Sturdy, time-proven core and coil construction meets repeated short-circuit stresses of network operation.

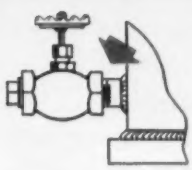
ALLIS-

CINCINNATI

ALLIS-CHALMERS

NETWORK TRANSFORMERS

Safe, dependable no-load tap-changing mechanism. Handle inserted through two-inch opening on cover operates the tap-changing mechanism. Handle cannot be removed unless it is in positive tap position. Cover location of handle entrance eliminates packing gland maintenance.



Threaded valve connections to tank are solder-wiped for extra protection. Valves are located for easy access. Globe-type valves with non-rotating seats close tight, avoid wear on valve seats.

Spiral-wound gaskets have proved their superiority over other types of gasketing material for sealing bushings in the tank wall in over 6 years' continual use. Alternate plies of preformed spring-like metal and non-metallic fillers provide unusual resilience and actually adjust themselves to changes in operating conditions. Gaskets can be installed without cements or grease. They can be quickly removed if required and may be re-used if necessary.

CHALMERS

A-C ALLIS CHALMERS

FIRE!

PUT IT OUT IN SECONDS
with a Kidde Portable extinguisher

Unless you get the jump on fire the minute it starts, you stand a good chance of kissing your business good-bye.

That's why it's so important to have a Kidde portable extinguisher near *every* fire hazard in your plant.

Protect motors, electrical equipment, flammable liquids and machinery with Kidde portables. Then, when fire strikes, you're ready for it.

Just grab a Kidde CO_2 or dry chemical portable, aim the horn, pull the trigger, and—Whoosh! No more fire!

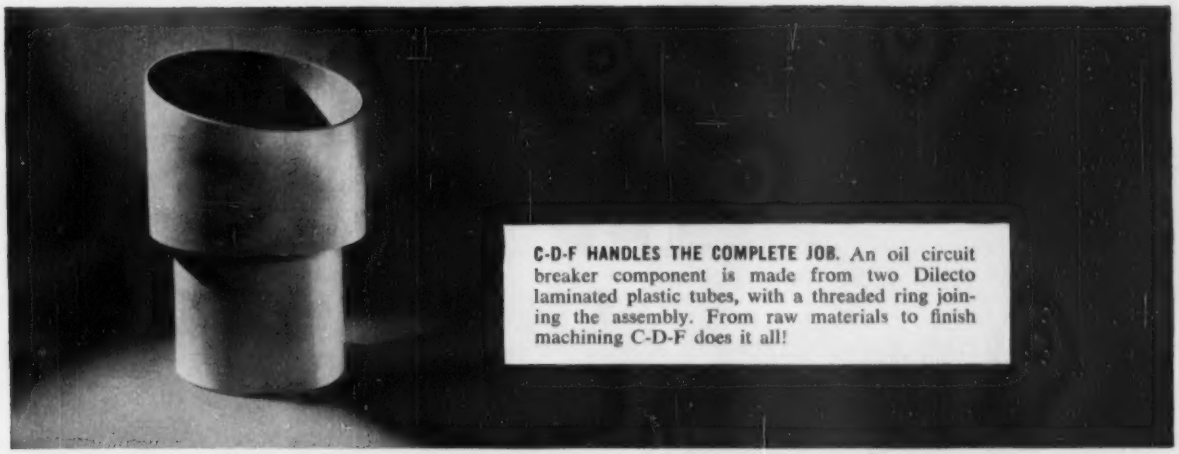
Your *next* fire could be your *last*... Contact Kidde today!

Kidde (K Kidde)

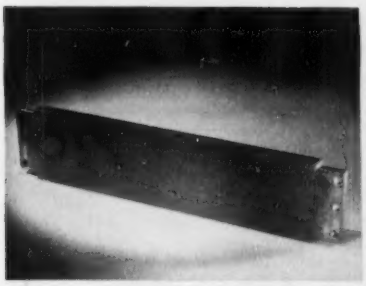
The words 'Kidde', 'Lux', 'Lux-O-Matic', 'Fyre-Freez' and the Kidde seal are trademarks of Walter Kidde & Company, Inc.

Walter Kidde & Company, Inc.
1230 Main Street, Belleville 9, N. J.

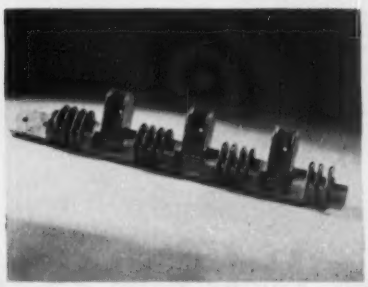
Walter Kidde & Company of Canada, Ltd., Montreal—Toronto



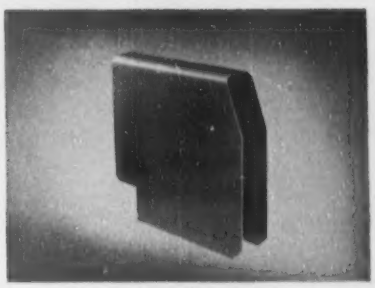
C-D-F HANDLES THE COMPLETE JOB. An oil circuit breaker component is made from two Dilecto laminated plastic tubes, with a threaded ring joining the assembly. From raw materials to finish machining C-D-F does it all!



C-D-F KNOWS HOW TO MACHINE PLASTICS. A bus bar gets a covering of molded Dilecto over copper supplied by the customer. The plastic ends are skillfully trimmed on a smooth saw.

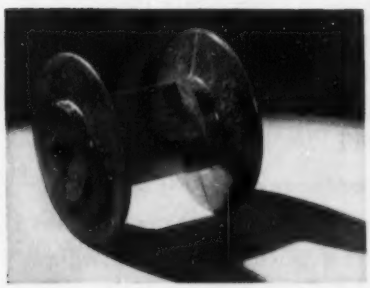


C-D-F MOLDS MANY SPECIALTIES. This shaft insulator for a circuit breaker is molded from C-D-F's cloth-based industrial thermosetting plastic, Celoron. Note complexity of mold, clean detailing.



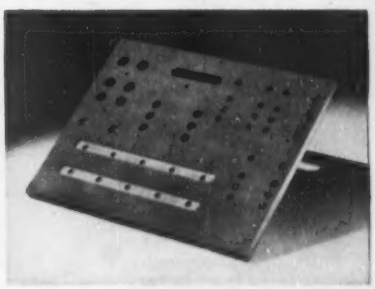
C-D-F USES MODERN METHODS. Large quantities of arc chute barriers are made from paper-based Dilecto. Operations include pressing, cutting, post-forming and trimming.

DEPENDABLE equipment RELIES on C-D-F INSULATION!



C-D-F OFFERS UNIQUE MATERIALS. This contact shaft for an air circuit breaker is another example of molded C-D-F Celoron used in switchgear because of its high impact strength.

C-D-F IS A SKILLFUL ASSEMBLER. Made from Grade C rolled Dilecto tubing, these pots are turned, bored, slotted. Then a macerated plastic end is inserted and arc resistant varnish finish applied.



C-D-F UNDERSTANDS THE ELECTRICAL INDUSTRY'S NEEDS. Precisely machined to close tolerances, Dilecto panel boards guarantee dependable insulation, help designers save space.

See our catalog in Sweet's Design File for basic product data and sales offices. Write for detailed information, or send us your print for quotation.

CDF *Continental-Diamond Fibre*

CONTINENTAL-DIAMOND FIBRE COMPANY

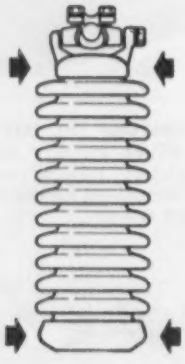
NEWARK 15, DELAWARE

LAPP CLAMP-TOP LINE POST

Easy to install...
Easy to change...
Secure in operation

For original installation, the Lapp Clamp-Top Line Post, with clamp attached, is mounted (stud bolts of any length are interchangeable). Keeper cap screws are loosened, and one removed. Keeper is rotated out of position, conductor dropped in, keeper and cap screw replaced, and both screws tightened. Cap screws have captive washers—there's *only one loose part* per insulator throughout installation.

To change out an insulator, the trunnion screw is backed off (not removed). Clamp stays on the conductor and is slipped back into position in new insulator. All clamps are interchangeable in all sizes of Lapp Clamp-Top Line Posts. Line can be reinsulated for higher voltage with ordinary hot line tools with greatest convenience.



All Lapp Post insulators are built with hardware *externally* attached. Cracking is prevented because thermal movement or mechanical strains can load porcelain only in compression. This provides an extra margin of operating security, assures long insulator life and low line upkeep.

Lapp Insulator Co., Inc., Le Roy, N. Y.

Lapp

Vacuum dried, oil impregnated crepe paper

NOW IN PRODUCTION AT IRVINGTON!

Your requirements for crepe paper insulation can now be supplied by Irvington — the *leader* in electrical insulation.

Crepe paper and oil are degasified under very high vacuum to assure freedom from moisture and provide good electrical properties.

The paper is packaged in cans to meet your specific requirements for number and size of rolls. Roll sizes include ½" x 4 yards, 1" x 4 yards, 1" x 18 yards, 1" x 36 yards. Cotton yarn and copper mesh can also be included.

Use Irvington Crepe Paper on your low- and medium-pressure gas-filled cable — and also on oil-filled and pipe-type cable.

Look to
IRVINGTON
for Insulation Leadership

INSULATING VARNISHES
VARNISHED CAMBRIC
VARNISHED PAPER
VARNISHED FIBERGLAS
INSULATING TUBING
CLASS "H" INSULATION

Other IRVINGTON Insulations for Utilities

Harvel Oil Stop 621 • Fibron® Plastic Tape • Temflex® 105 Tape • No. 32 Red Enamel

IRVINGTON VARNISH & INSULATOR

DIVISION OF MINNESOTA MINING & MANUFACTURING COMPANY

21 ARGYLE TERRACE, IRVINGTON 11, N. J. • PLANTS: IRVINGTON, N. J.; MONROVIA, CALIF.; HAMILTON, ONTARIO, CANADA

Wherever hard-driving, cost and profit-minded men go to work . . . there you'll find massive, powerful FWDs shouldering their way through the job . . . getting it done quickly, safely, efficiently—beating work-schedules that put ordinary trucks into the shop for repairs.

For FWD is *"More Than Just a Truck!"* This basic unit of heavy-duty driving power opens up a whole new concept in on-the-job achievement . . . custom-engineered to out-perform mass produced, mass marketed trucks on the basis of power, dependability and economy of operation.

FWD's *Advanced Math-Matic Design* correctly proportions power to weight on front and rear axles, making every pound of load help haul itself! Each wheel's cargo only makes it grip harder, turning every ounce of power into greater controllable traction and steering safety.

- **Higher power-weight ratio than any ordinary truck!**
- **Up to 82% greater tractive ability on or off the road!**
- **30 to 37% longer tire life!**
- **Greatest operating safety under any driving condition!**
- **Weight distribution permits larger legal payload!**
- **Fuel consumption no greater than in ordinary trucks!**

FOUR AND SIX WHEEL DRIVE MODELS FROM 14,500 TO 60,000 LBS. G. V. W.

Write today for FREE, ILLUSTRATED BROCHURE on units in the weight classification you normally use. We'll also include your copy of "The Truck That Went To College" — detailed data on 7 years' intensive truck research conducted by the University of Wisconsin's College of Engineering.

BUILDERS OF AMERICA'S FWD FOREMOST HEAVY-DUTY TRUCKS

MATH-MATIC DESIGN

THE FOUR WHEEL DRIVE AUTO COMPANY, CLINTONVILLE, WISCONSIN, *Canadian Factory,* KITCHENER, ONTARIO

what are new plants made of?

Into a new plant go steel and glass and concrete—machines and metals, manpower and money.

More important, however, is the skill, the experience and the resources of the planners and constructors. The engineering and construction firm that stands behind the plans of a new plant may well hold the key to its future success.

Over its half-century of existence Ebasco has engineered and constructed more than two billion dollars of new plants. Ebasco can be brought into action the moment the need for new facilities is recognized—can cover every step from site selection, preliminary planning, engineering, actual construction right through initial plant operation.

Our services are available, practically and economically, in building both large and small projects. Every new plant handled by Ebasco receives the same quality engineering and construction—the mark of Ebasco projects all over the world.

Our booklet—"The Inside Story of Outside Help"—tells the story of Ebasco and its services. For a copy, without obligation, write Ebasco Services Incorporated, Two Rector Street, New York 6, New York

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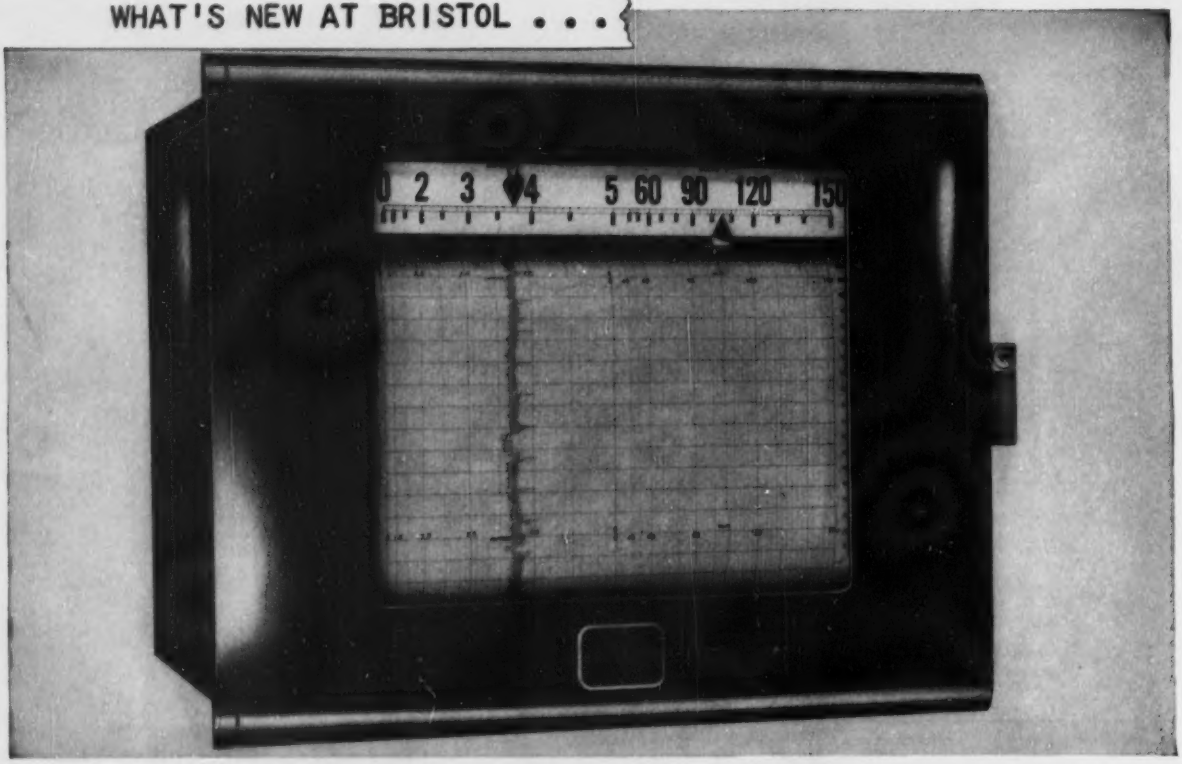
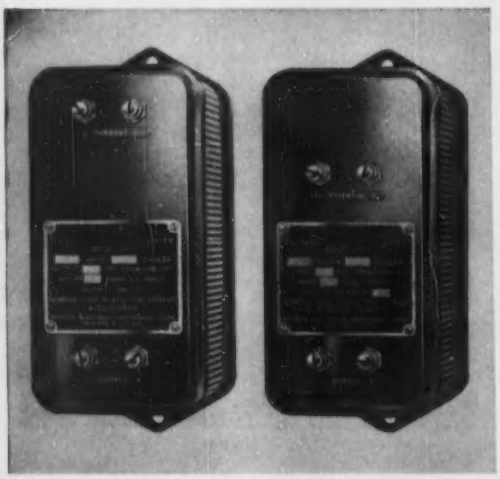
Ebasco Teamwork gets things done anywhere in the world

WHAT'S NEW AT BRISTOL . . .



Record current and voltage on one chart

with Bristol's Electronic Dynamaster Recording Voltmeter-Ammeter



THERMAL CURRENT and thermal voltage converters used with the Dynamaster Recording Voltmeter-Ammeter.

This two-pen strip-chart potentiometer records voltage and current simultaneously on the same chart. Measurements are made from a thermal voltage converter and a thermal current converter — a-c/d-c transducers with extremely high response speeds.

Here's what you get in this voltmeter-ammeter:

Accurate measurement: The Dynamaster is an accurate electronic instrument of simple, rugged construction. It is well suited for central station use under severe operating conditions, as well as for research and laboratory use.

Fast response: 2 seconds for full range pen travel. Every variation is recorded. Measurement is continuous.

Improved chart record: Two-zone, 12-inch strip chart with 11-inch calibrated width. Records are side-by-side — easy to read and compare, with expanded scales in the operating ranges. Chart speeds from ¾-inch per hour to 4-inches per second.

Kilowatt and Kilovar recorder: The Dynamaster is also available, using Bristol Thermoverter Transducers (thermal watt converters) as the primary elements, for recording watts and vars on a single two-zone chart.

Write for more information to The Bristol Company, 116 Bristol Road, Waterbury 20, Conn. 4.31

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POINTS THE WAY IN HUMAN-ENGINEERED INSTRUMENTATION

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

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read WIRE, PIPE or CONDUIT size at a glance

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- heavy gauge stainless steel
- inside and outside caliper, calibrated in 32nds
- precision-etched direct reading scales
- pipe size to i. d. conversion table
- genuine leather sheath

Frankly, we never intended to get into the WIRE-MIKE business. Our engineers designed WIRE-MIKE as a labor of love—because they felt such a tool was long overdue. We made several hundred for our friends, and thought we had heard the last of it.

Not so. Before you could say "WIRE-MIKE", we were snowed under with demands for this handy tool. So, although it's a little out of our usual line, we decided to put WIRE-MIKE into production at a nominal price.

A few improvements have made WIRE-MIKE better than ever—and now everyone can have this famous precision lifetime tool for measuring conductor (stranded, solid or ACSR), conduit (rigid or thinwall) and pipe sizes **instantly**. Only $1.95 at your Burndy supplier. **Burndy**—Norwalk, Connect., Toronto, Canada. **Factories:** New York, California, Toronto. **Export:** Philips Export Company.

It's good business to connect with

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... **FIRST name in electrical connectors; tools; methods**

NO CHIPS, CRACKS, OR SPALLS

Laboratory tests to determine the thermal resistance of Kimble *Tempered* Glass Insulators produced no chips, cracks or spalls even after 10 cycles from 40° to 200° F cold-to-hot, hot-to-cold. This high thermal resistance is further demonstrated by their service in the field where they have proved to have unusual resistance to heavy power arcs.

Kimble *Tempered* Glass Insulators save installation time because it's never necessary to loosen up for line-up with the conductor. Their great strength always allows another quarter-turn.

If it's on the pin, it's in service

Tests far in excess of A.I.E.E. standards have proved it impossible to puncture a Kimble *Tempered* Glass Insulator in air. Even lightning surges have failed to damage them. In the event of shattering due to severe mechanical shock, insulator disintegrates into small, non-sharp fragments. Trouble shooters can locate broken insulator—fast.

What's the secret? *Tempering*, a Kimble development in glass insulators that adds a new element to the many natural virtues of glass insulators. Kimble insulators are more than strong enough to meet the severe tests required.

Why not see how *tempered* glass can cut your line maintenance costs. Write for the new descriptive folder that gives complete details. Address: Kimble Glass Company, subsidiary of Owens-Illinois, Department EW-12, Toledo 1, Ohio.

KIMBLE INSULATORS
AN (O-I) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

Here's what we mean by SIMPLE!

To change the ratings on this regulator, just move two limit switch pins

DO A WEEK'S job in minutes! With the *Vari-Amp* feature on Allis-Chalmers single-phase power regulators only three simple steps are needed to change ratings.

All you do is (1) open the position indicator window, (2) place the "raise" and "lower" limit switch pins in desired positions, and (3) close the window. That's all there is to it! No need to take regulator out of service. No electrical connection to make. No complicated adjustments or wiring. All other single-phase power regulators require 10 complicated, time-consuming operations to change windings.

Get Five Ratings in a Single Unit

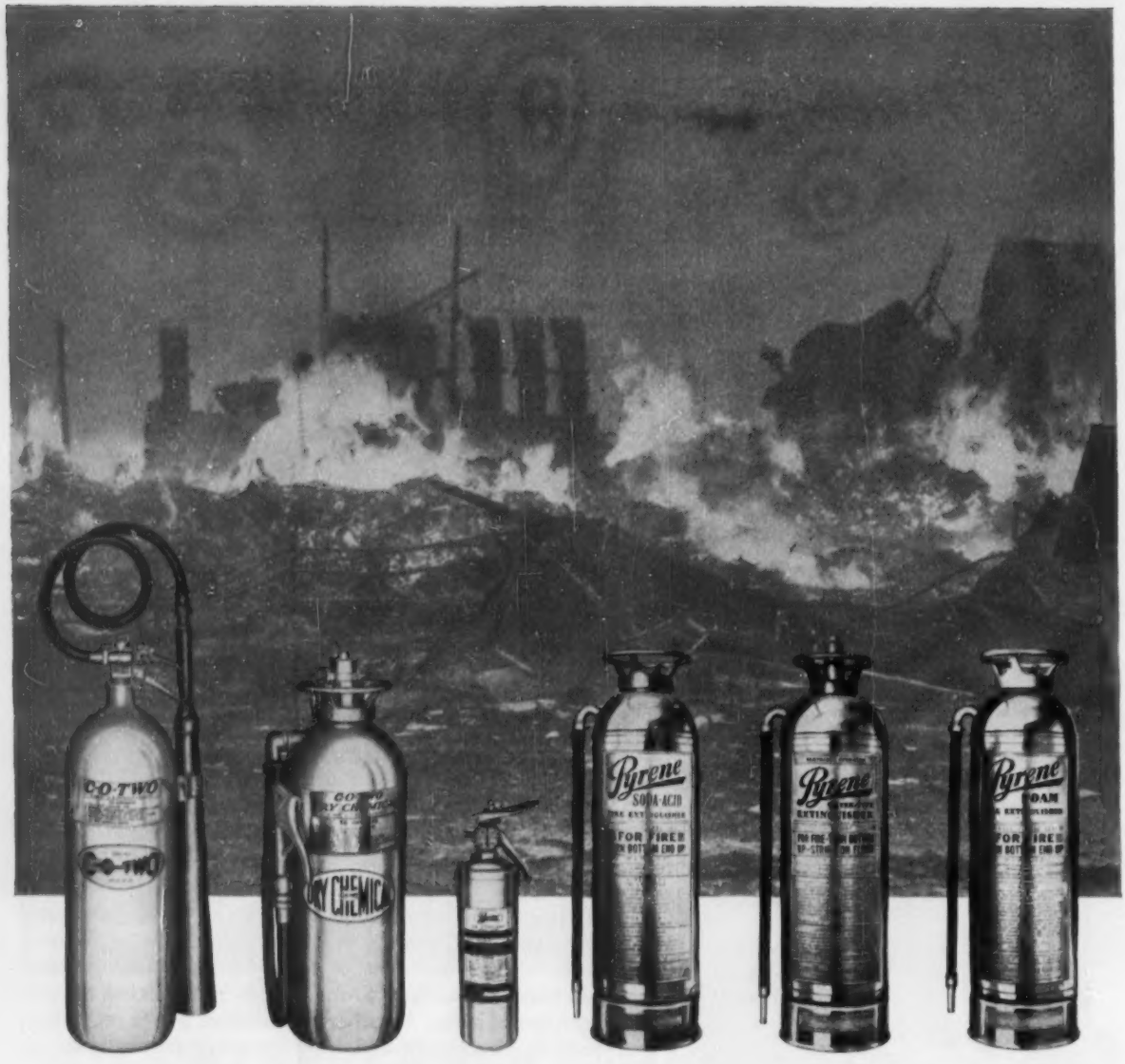
With Allis-Chalmers single-phase power regulator you get five ranges of operation instead of the usual two. In most cases, initial cost is lower because of this flexibility. And, you can increase capacity with only a proportionate decrease in range of regulation. The *Vari-Amp* feature also provides extra short-circuit capacity.

Get complete facts on the convenience, flexibility, and reliability of Allis-Chalmers single-phase power regulators. Call your nearby Allis-Chalmers office or write Allis-Chalmers, Milwaukee 1, Wis., for Bulletin 01B6065C.

A-4462

ALLIS-CHALMERS

Originators of 5/8% Step Regulation



ALL TYPES...ANY CLASS FIRE!

Since different fire hazards require different types of fire extinguishers, PYRENE—C-O-TWO manufactures all types . . . the finest and most complete line on the market today.

When doing business with PYRENE—C-O-TWO, you receive unbiased advice on what is best for your particular fire hazards, whether class A, B or C. Also, there is a well-rounded sales engineering organization having nation-wide representation to render top quality service wherever you're located.

Don't take unnecessary chances . . . the extensive fire protection experience of PYRENE—C-O-TWO over the years is at your disposal without obligation. Get complete facts now!

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Sales and Service in the Principal Cities of United States and Canada

COMPLETE FIRE PROTECTION

portable fire extinguishers . . . built-in fire detecting and fire extinguishing systems

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Complete Hydraulic Closing for Circuit Breakers

PACIFIC ELECTRIC
Type OA
HYDRAULIC OPERATOR
(Compressed-Gas Accumulator Type)

- Compact
- Low Inertia
- Rapid Response
- Smooth Operation Without Impact
- Electrically and Mechanically Trip Free
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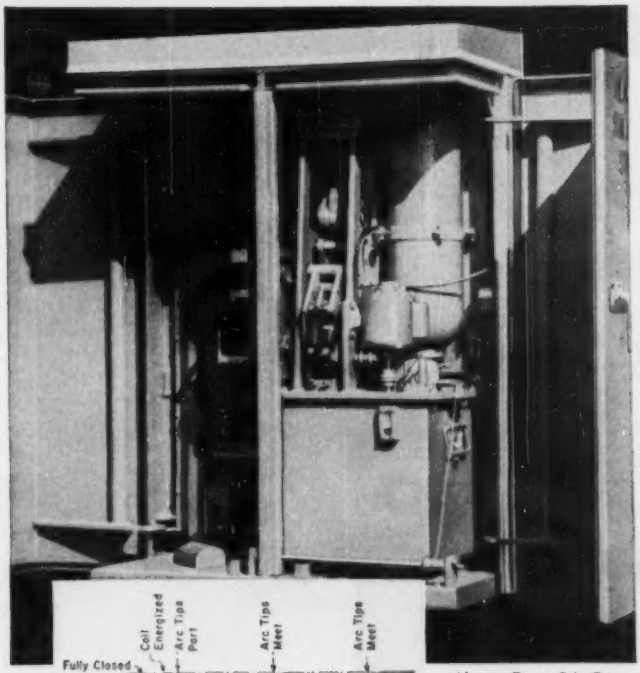
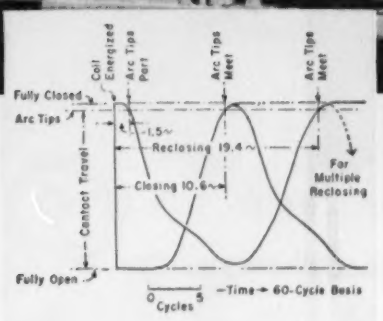
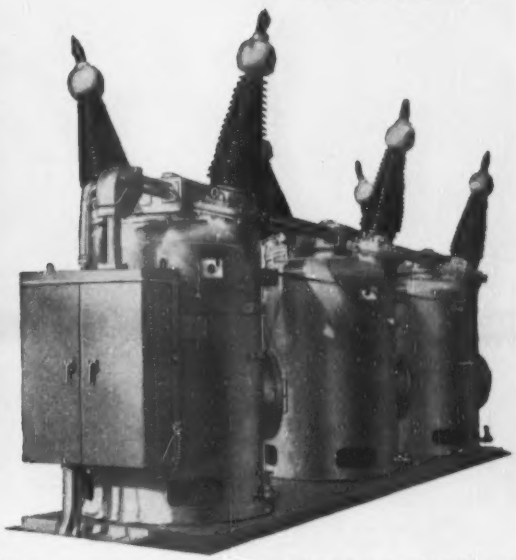




Above: Type OA Operator in Cabinet with doors open. Shows accumulator and sump tank that contains all hydraulic components.

At left: Typical Time-Travel Curve—taken with oil in tanks. Shows 20-cycle reclosing (for shorter time refer to factory). Five immediate reclosures obtainable, if required, all at same speed.



Above: This 115-kv, 3-cycle, 5000-mva Pacific Electric circuit breaker with Type OA hydraulic operator in use on a leading power system.

SIX YEARS AGO Pacific Electric introduced hydraulic energy transfer as a part of circuit breaker closing. Hundreds of these semi-hydraulic operators (the Type MO-5) are used by leading power systems, from 115 kv thru 230 kv. These operators also embody hydraulic interlocking and hydraulic control of deceleration (which Pacific pioneered years previously). They represent an important part of Pacific Electric's line.

Also six years ago, Pacific Electric started development of a *fully* hydraulic operator because the upward trend of ratings made it desirable to have more powerful operators of smaller physical size.

These new fully hydraulic operators (the Type OA-4) are in production; deliveries to several power systems have been made. Their use in system protective service dates from Sept. 1953.

The new operator has the advantages outlined at the top of this page. A feature is a direct-connected piston-cylinder unit that closes the breaker and that also is the means for decelerating hydraulically both the opening and closing strokes. Hydraulics are also utilized for other purposes—wherever rapid response without impact is a requirement.

For further information, ask for Catalog 587.

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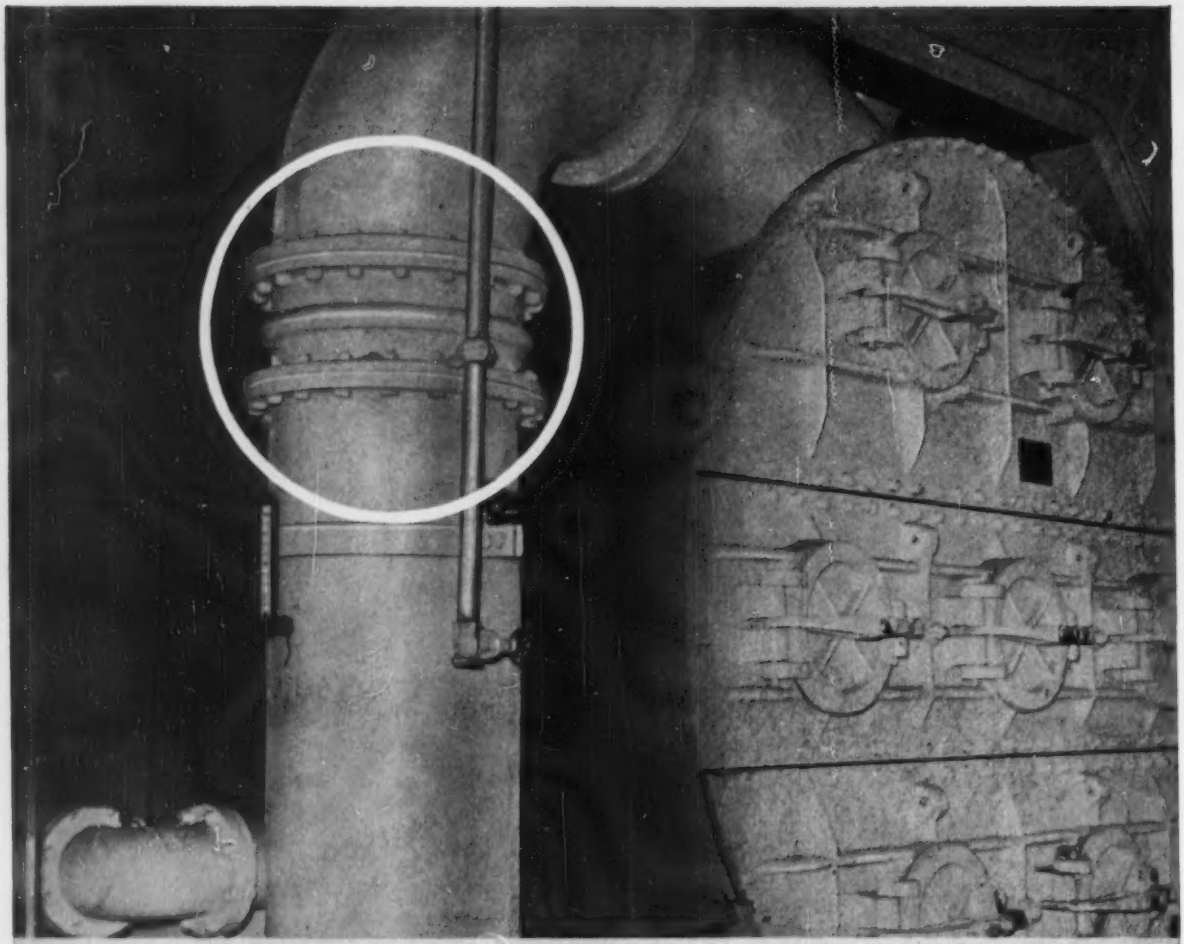

30-YEAR SERVICE RECORD CHALKED UP BY U. S. EXPANSION JOINTS IN WEST COAST POWER PLANT

Above is one of 12 U.S. Expansion Joints installed 30 years ago in a California utility plant. Despite their age these joints are still functioning.

U.S. Rubber Expansion Joints are economical, flexible connections used in pipe lines to take up the stresses due to vibration, expansion and contraction. They prevent the transmission of noise, and take care of misalignment. They have no moving parts to wear or bind and thereby shorten service life.

U.S. Rubber Expansion Joints can be installed on both new and old piping and equipment. These joints plus engineering service are available through any of our 27 "U.S." District Sales Offices, or write address below.

"U.S." Research perfects it...
"U.S." Production builds it...
U.S. Industry depends on it.

US RUBBER

UNITED STATES RUBBER COMPANY
MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

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Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Cord Tire Fabric • Adhesives • Belt Conveyors • Wire and Strand

The data you need easy to find in this Uptegraff ENGINEERING MANUAL

Designed for quick reference, this manual gives in easy-to-find form, dimensions, performance data and other essential information on Uptegraff Power Transformers of all commercial ratings from 750 to 10,000 KVA. It describes liquid-filled, single and three-phase transformers up to the 67 KV Class. Standard and optional accessories are listed; terminal arrangements, vector relationships and schematic representations are shown.

Copies of this engineering manual will be useful in many ways in executive, engineering and operating departments.

R. E. Uptegraff Manufacturing Co.
Scottdale, Pennsylvania

Send for free copy of this useful Uptegraff Power Transformer ENGINEERING MANUAL. Write on company letterhead or use the coupon below.

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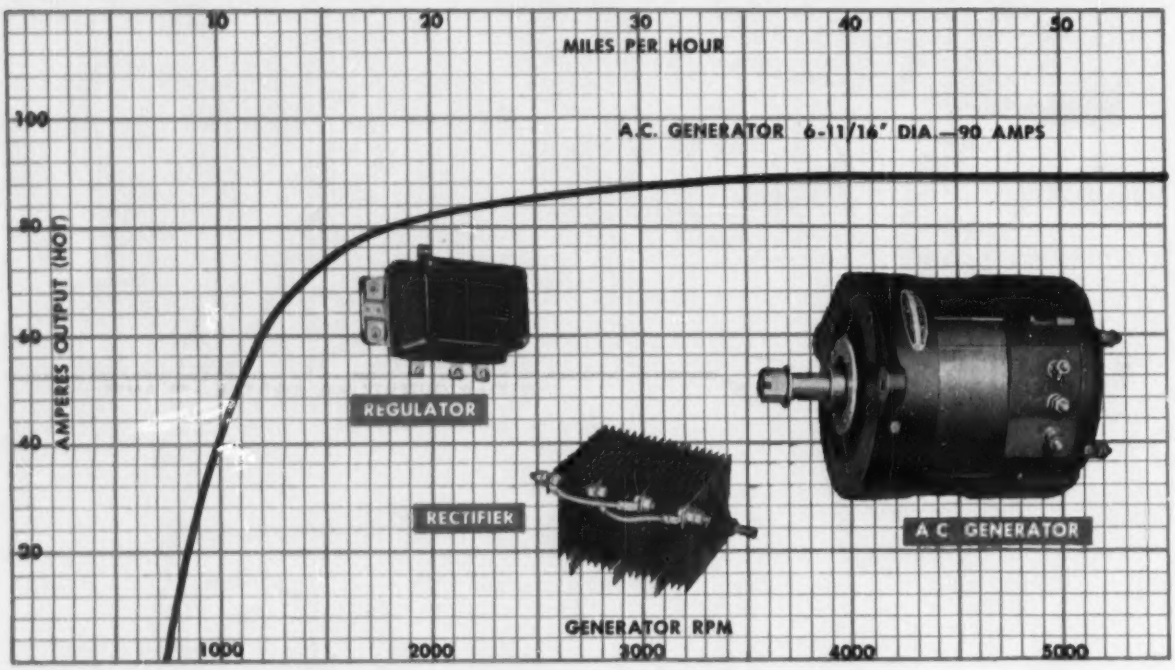
Power Packed and

HERE'S THE A.C. ANSWER TO EXTRA-HEAVY ELECTRICAL DEMANDS



DELCO-REMY

A. C. Generator, Regulator and Rectifier

Here's the answer for "problem" vehicles—Delco-Remy's new long-lived A.C.-D.C. charging system! It's specifically designed to meet the *extra*-heavy electrical demands of public utility trucks and other vehicles equipped with two-way radio, floodlights or any extra electrical units . . . ample current reserve picks up discharged battery quickly in operation. Delco-Remy A.C. generators are suitable for use at all engine speeds.

With output ranging from 30-40 amperes at curb idle and up to 90 amperes at higher engine speeds, the new Delco-Remy A.C.-D.C. charging system meets all electrical needs under the toughest operating conditions. Included in the new system is the A.C. generator, a matching regulator, and a rugged, dependable dry-plate rectifier which converts generator A.C. output to direct current.

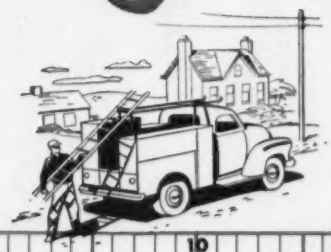
Application packages complete with installation instruction sheets for popular makes of cars and trucks are now available. The conversion job is simple. For further details and application data, see your nearest United Motors distributor.

A GENERAL MOTORS PRODUCT — A UNITED MOTORS LINE

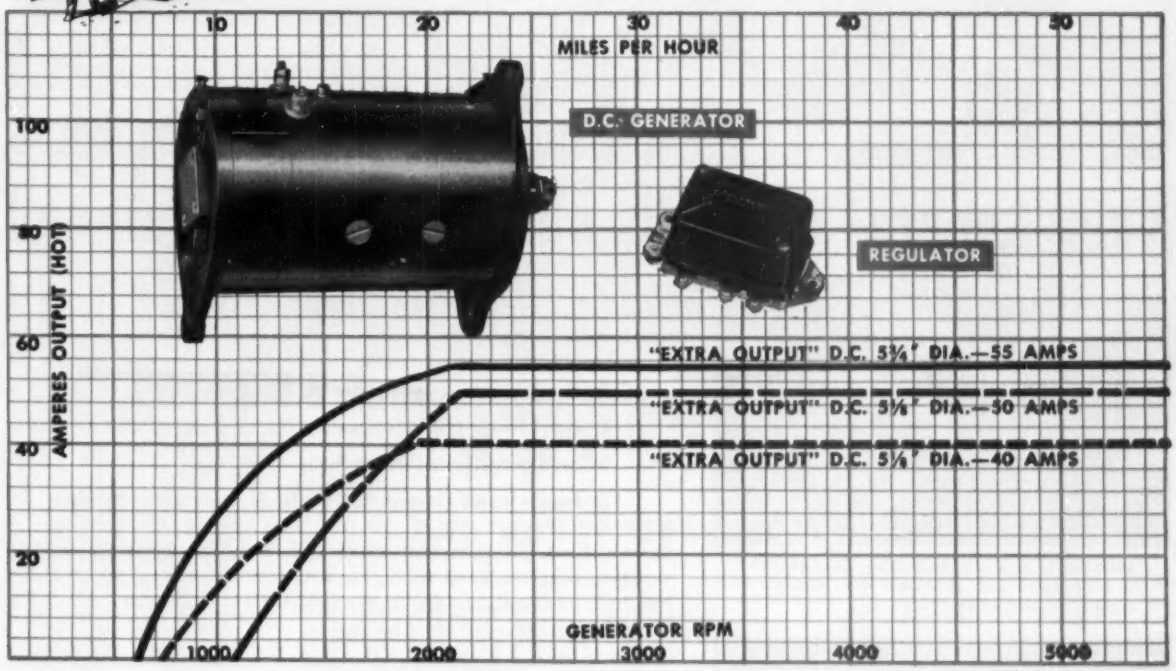
DISTRIBUTED BY WHOLESALERS EVERYWHERE

WHEREVER WHEELS TURN OR PROPELLERS SPIN

Right for the Job



HERE'S THE D.C. ANSWER TO HEAVY ELECTRICAL DEMANDS



DELCO-REMY

Extra-Output D. C. Generators and Matching Regulators

Delco-Remy extra-output D.C. generators are an economical answer to the electrical needs of public utility pickup or panel trucks as well as other vehicles with additional lights, two-way radios, or other special electrical equipment in medium to heavy-duty service. Delco-Remy extra-output D.C. generators are low in cost, simple to install, economical to maintain.

DELCO-REMY 40-AMP GENERATOR has low cut-in, about 7 mph, charges from 11 to 17 amperes at curb idle . . . full output about 18 mph —for vehicles customarily used in heavy traffic.

DELCO-REMY 50-AMP GENERATOR has slightly higher cut-in, about 11 mph . . . full output about 21 mph—for vehicles customarily operated at higher speeds, with minimum slow driving.

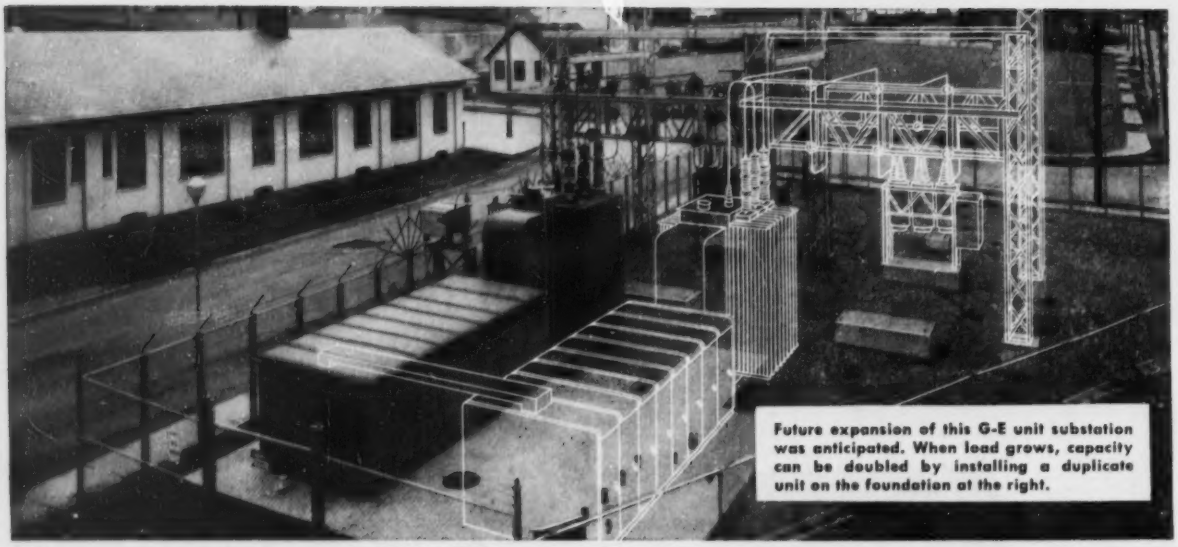
DELCO-REMY 55-AMP GENERATOR has very low cut-in, about 6 mph; charges at curb idle from 20 to 30 amperes . . . attains full output at 20 to 25 mph—for vehicles customarily operated at low speeds with added electrical loads, such as city taxicabs and police cars.

For further details and application data, see your nearest United Motors distributor.

Delco-Remy

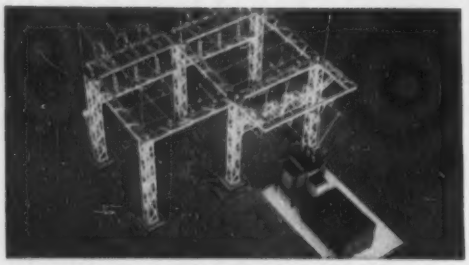
DIVISION, GENERAL MOTORS CORPORATION, ANDERSON, INDIANA

WHEREVER WHEELS TURN OR PROPELLERS SPIN

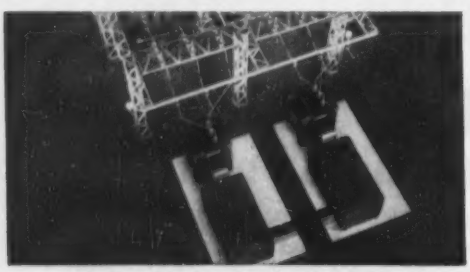


Future expansion of this G-E unit substation was anticipated. When load grows, capacity can be doubled by installing a duplicate unit on the foundation at the right.

This General Electric substation is designed to grow with your load



1954 Single unit is installed, but load growth is anticipated and additional steel structure is also installed at this time.



1956 Capacity doubled to meet load growth. Bus tie provides emergency interconnection to restore service in case of outage on high side.

1958 Capacity tripled as load growth continues. Low-voltage-selective arrangement provides service continuity in emergency.

And with this arrangement, it's easy to—

1. double or triple capacity by adding duplicate units

2. add additional "match and line-up" feeders

3. make connections to the high-tension structure

General Electric unit substations make it both easy and economical to supply growing loads. By adding capacity in small units, as shown at the left, utilities avoid investing in overcapacity which will not be used for years—and which may never be used.

With G-E unit substations, it's easy to increase capacity by simply adding additional units. In this low-voltage selective arrangement, a bus tie with normally open tie breaker provides an emergency interconnection between the low-voltage sides of two or more individual substations. This permits restoration of service following an outage of either a transformer or high-voltage circuit.

Additional "match and line-up" feeders can easily be added to this design because the ends of the switchgear are accessible—not bottled up as in the case of double-ended substations. Additional match and line-up feeders will be available from the factory for years after the original equipment was purchased.

Standard high-voltage steel structure is another factor in easy expansion. It's easy to add to the structure if more lines are brought in, or if more units are added.

For further information about unit substations that provide easy expansion with a bonus in service continuity, ask your G-E apparatus representative for bulletins GEA-3800 and GEA-5847 or write to General Electric Company, Schenectady 5, New York. 512-2

GENERAL ELECTRIC

ANDERSON *dependability*

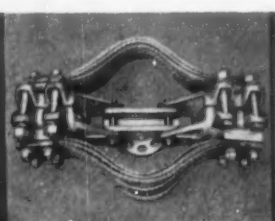
has never been limited to size or type

The large and complete line of Anderson Connectors, Clamps, Fittings and Accessories *has grown with the needs of the electrical power industry.* Every individual product was designed and engineered to perform a specified service . . . to meet a definite need . . . and provide the user with the utmost faith in its performance and efficient dependability.

To us, this comment by a leading utility engineering executive typifies the measure of dependability we strive to build into every product we manufacture: "ANDERSON DESIGN MEANS QUALITY *plus* STRENGTH IN THE RIGHT PLACES!" Every step in our manufacturing process, from ingot to finished product, is rigidly controlled to maintain the reputation for quality and dependability we have earned through our lifetime.

TYPE FLD
BRONZE LUGS
For stranding copper cables, from #10 Sol. to 2000 MCM, off for bus, equipment spades, switch pads, etc. Single clamping also available.

TYPE S
CAST ALUMINUM
SLIDE COVER BOXES
For junctions, meters, Fuse & Terminal blocks and similar devices. Based for individual needs; weatherproof. No maintenance cost. Screw covers available.



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ALUMINUM EXPANSION
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For coupling Aluminum Tubing. Aluminum clamping members and hardware eliminate troubles caused by plated Bronze Connectors.

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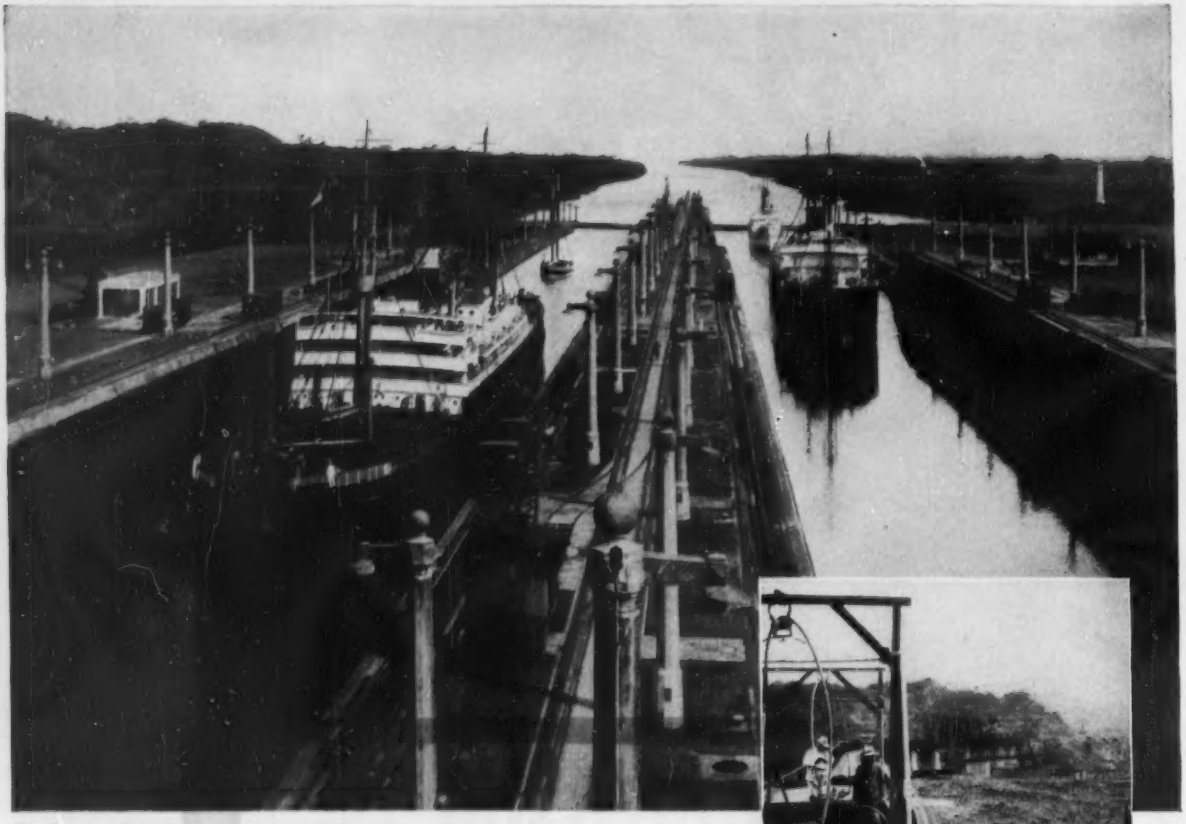


The Panama Canal

Laying Kerite Cable across the Isthmus, 1908

Since it was first manufactured almost a century ago, Kerite insulated cable has been closely integrated with the international development of the communications industry. One of the most important installations of Kerite cable was made in 1908 across the Isthmus of Panama, a distance of 50 miles, uniting the Atlantic and Pacific ocean cables.

Early performance records of this outstanding product indicated that Kerite cable was unusually well equipped to withstand the extremely severe conditions attending this tropical installation. This cable, originally laid on the ground in the jungle, was submerged for 30 miles in Gatun Lake upon completion of the canal.

As a result of the operation of this initial cable, a second one was installed in underground ducts in 1918 under the supervision of Mr. C. R. R. Harris, now President of The Kerite Company. Subject to similar adverse conditions, this cable continues to perform the important function for which it was designated at a critical point in communications history.

The value and service life of a product can be no greater than the integrity and craftsmanship of its maker.

KERITE CABLE

THE KERITE COMPANY—30 Church St., New York 7, N. Y.
Offices also at 122 S. Michigan Ave., Chicago; 582 Market St., San Francisco;
3901 San Fernando Rd., Glendale 4, Calif.; 31 St. James Ave., Boston

1955 a year of opportunity

Standing on the threshold, the course of the year ahead appears more susceptible to our own handiwork than any year in a quarter century. During the past 25 years the electric utility industry along with other industries has often been tossed on the larger economic, social, political, and preparedness waves that rocked the nation.

A depression followed by growing threats of federal encroachment characterized the first years of the period. Then came years of defense preparations, war demands, and war scarcities. The industry was not even allowed to build back the capacity margins knocked down by the war shortages before there followed another period of rearmament and partial conflict.

Even the fast-dimming present year has been characterized by a transition from a defense to a peacetime economy that has kept the industry edgy.

But the past few years and especially the present one has given the industry the time and incentive to build the foundations for the year ahead. In this issue the editors of Electrical World review the outstanding industry events of the past year and offer their predictions for the one ahead.

The industry has the necessary margins to meet this winter's peak loads. On the boards are firm and large-scale plans for enlarging that capacity to keep pace with the economy in the years ahead. A moderate federal administration has made planning by power companies less hazardous. And the industry has enjoyed a continual period of growth despite lags in some segments of the economy.

The year ahead for the electric utility industry will be pretty much what the industry chooses to make it. There are just enough "ifs" to make it challenging.

- If the industry sells hard enough, it stands to better its rate of growth and contribute importantly to the general economy.

- If public relations are handled with courage and foresight, the industry stands to merit the opportunities offered it by a fair-minded national administration. It also stands to make friends of its customers and betters customers of its friends.

- If its plans are drawn with confidence and optimism that the period demands, the industry will make its contribution to the year ahead and to future years in such a way as to assert its leadership.

These "ifs" and others too are the opportunities of the year ahead. But an opportunity is not a gift but rather a chance—a fit time, a favorable juncture of circumstance.

The industry must decide whether the year of opportunity will also be a year of accomplishment—or whether 1955 will be just another year.

'Operation Snowflake'

One of the most far-reaching appliance promotions the industry has seen in a long time came to a close Christmas morning. It was United States Steel Corp's "Operation Snowflake." Using the slogan, "Make it a white Christmas, give her a major appliance," USS carried out a heavy campaign of its own and at the same time whipped up phenomenal support from utilities and dealers across the country. Idea was to help manufacturers, distributors, and dealers move more steel-made goods. It is an outstanding example of how diverse but interdependent industries by getting together can work to the benefit of all.

Ask the Ladies

In one of those small but rare acts of courage that too often go unnoticed, the Region 2 section of the Public Utilities Advertising Association invited a panel of women to tell the group what is wrong with utility advertising.

As might have been expected, the all-female panel, consisting of two homemakers and a public relations expert, had a few sharp comments; but they offered some helpful hints too. Then, bless 'em, the panelists handed out just enough plaudits to give the whole discussion a ring of wisdom and sincerity (EW, Dec. 20, p 19).

There was, for instance, the comment that electric companies have not tailored their private enterprise story to appeal to the feminine element. "There is a huge gap between the 'yak' 'yak' and actual doing and acting to get that understanding across," was the pert comment of the public relations expert.

There was the suggestion, this one from a housewife, that women's magazines be used to push utility advertising campaigns.

Still another was that women executives have a place in utility management.

Then came the clincher, a remark that would seem to assure women speakers a place on all future PUAA programs. Said one of the homemakers, "If your advertising weren't good, I wouldn't be loaded up with equipment (appliances) in my house."

It is often the woman of the house that pays the utility bills, buys the appliances, and lodges the service complaints. To be effective, a utility advertising program must appeal to women. And the most direct way to find out what appeals to them is to ask them. Add to our forecasts, then, that there will be more panels of this sort in the year ahead.

Meeting the People's Needs

Meeting the people's needs is always good business.

Electric companies are organized to meet those needs as they relate to power. Witness the recent offer of three Pacific Northwest companies to put down $350,000 for the initial surveys and planning for the proposed 1,105,000-kw John Day hydroelectric project on the Columbia River. Pacific Power & Light Co, Portland General Electric Co, and Washington Water Power Co made the joint offer in the interest of supplying customer power needs in the years ahead. At best the proposed project could not begin operation before 1961, and it is likely that a longer time would be required if federal funds are used.

There are no strings attached. Of course if the federal government later builds the project, the companies will be reimbursed. But the offer was not predicated on construction by the companies involved, a partnership, or the federal government. In any event, the companies do not expect interest on the money and fully realize that the project may never be built.

It is no wonder that the federal government was caught off balance by this offer. Veteran government officials could find no precedent for beginning a project of this magnitude with this kind of financing. No decision has yet been made as to whether the offer is to be accepted.

The action of the three companies points up the fact that the federal government is not an electric utility and was never organized to assume a utility responsibility in this field. Other matters of national importance have first call on the time and activity of government officials. The desire and ability to meet the people's power needs has never become a government responsibility nor a government creed.

The same is true to a lesser extent in the case of other government bodies in the power business.

Electric companies in the Northwest hope their offer will insure a large addition of generating capacity a year earlier than would otherwise be the case. They could act without the time-consuming red tape of government operation simply because the companies are organized to anticipate and meet the people's power needs.

Plastic Pipe—a Problem

Water-pipe grounds, long the standard of excellence in customer wiring, will be due for a new evaluation if plastic pipes come into general use for water services. They have made their appearance recently in a number of communities in various parts of the country. Transite and more recently plastic pipes for this purpose have been used on isolated water systems for a number of years. If they offer economic advantages to those responsible for the water systems, they will no doubt be used more extensively in time.

For the electrical industry and its customers this will present a real problem. First, it must be recognized that with a plastic connection between water meter and the water main, a ground connection to the water pipe in the house does not provide the high degree of protection that is available when the water service connection is completed with metallic piping. What can be done about it and who is responsible will probably be worked out in time.

The matter deserves the attention of the electrical inspector, the electrical contractor, and the electric utility. A committee is working on this with a view to considering changes in the National Electrical Code.

Where plastic water connections are installed, the home owner should have the matter called to his attention. It is the responsibility of the electrical industry to see that this is done and that some means of effective grounding is provided.

THE ELECTRICAL WEEK

The Issue's News Highlights . . . EEI President Quinton sums up the industry's achievements in 1954 . . . Major electric manufacturing companies foresee good business prospects for 1955.

Explosion at Commonwealth Edison plant destroys turbine, damages three other units, building.

"Buy American" regulations are eased, cutting 25% preference to U. S. firms on federal equipment orders.

Walker Cisler of Detroit Edison announces establishment of private international atomic energy program.

When opponents of the AEC-MVGC contract raised as one of the objections the record of Ebasco Services, Inc, in building the Electric Energy, Inc, plant at Joppa, Ill., they never mentioned one of the chief reasons for Ebasco's troubles—labor racketeers. Last week, in East St. Louis, Ill., Ebasco vindication was completed when Evan R. Dale, boss of AFL laborers, was sentenced to 15 years in federal prison and fined $10,000 for racketeering, and James Bateman, AFL Pipefitters union official, convicted of conspiracy with Dale on Dec. 7 (EW Dec. 13, p 97), was fined $2,000 and placed on five years probation. Together, they had been found guilty of attempting to extort $1,030,000 from Ebasco and EEI as the price for labor peace.

From Tennessee come two facts that throw some light on the thinking of a federal power advocate: Federal power groups are criticizing the Tennessee secretary of state for refusing to pay the legal bill of Joseph Volpe, who is representing these groups before SEC in opposition to the Dixon-Yates project; the Citizens for TVA group is going all out to block a move by TVA Chairman Herbert D. Vogel to promote self-financing of TVA's power operations as opposed to being dependent on government subsidy.

Virginia Electric & Power Co has attained the one-million-kw generating capacity mark with the new 100,000-kw unit at its Portsmouth station. Unit, now in full operation, was constructed at total cost of $116 per kw of capability, said to be low for combination coal-oil burning unit.

American Gas & Electric System continues to lead all other electric systems in total plant capacity with 4 million kw. This was achieved when the new 215,000-kw unit at the Tanners Creek Plant of Indiana & Michigan Electric Co went into operation.

Edward R. Trapnell, AEC's top liaison man with Congress during writing of new atomic energy law, will join Washington office of Bozell & Jacobs, agency for PIP.

Off The Washington Wire . . . The Administration and all interested federal agencies have agreed generally to support the Columbia Interstate Compact. State negotiators meet Dec. 29 in Spokane with full commission to vote on final approval. Suggestions of federal agencies will be aired then.

Growth of nuclear power plants in next 20 years will represent private investment of about $6 billion, according to a survey made by H. Dewayne Kreager, power specialist associated with John R. Steelman, former presidential assistant and now a Washington industry consultant. Of the investment, more than $1 billion will be in reactors. Kreager predicts that 80% of all new generating capacity in U. S. will be atom-fueled by 1975.

SEC has called halt to Dixon-Yates hearings. Next move will come after the holidays, in mid-January, with submission of briefs and oral argument.

Offer of $350,000 private funds by Portland General Electric Co, Washington Water Power Co, Pacific Power & Light Co, and other companies to the Army Corps of Engineers to speed work on John Day Dam, has been declined because of legal barriers. Cited is Flood Control Act of 1950 which limits planning advances to "states or political subdivisions, unless contributor did not desire return of the money."

Colorado PUC has authorized Public Service Co of Colorado to up rates $1.5 million a year for 6% return. Company had sought increase of $3.9 million to give a 6.75% return.

General Electric Co has broken ground for a multi-million dollar lighting plant at Hendersonville, N. C. GE expects to make site outdoor lighting capital of world. It will transfer all work now being done at Lynn, Mass., to new site.

Ray O. Martin, Ohio PUC Commissioner, has notified Governor Frank J. Lausche that he will leave commission upon expiration of his term of office which is Feb. 1.

Executive Changes . . . G. F. Foley, assistant secretary and assistant treasurer of Florida Power, was promoted to vice president . . . General Electric elected these vice presidents: F. K. McCune, R. L. Gibson, and W. H. Sahloff . . . E. J. Schwanhausser, executive vice president of Worthington Corp, was appointed president to succeed H. C. Ramsey, new board chairman. W. H. Feldmann, sales vice president, replaces Schwanhausser. Feldmann's successor is T. J. Kehane, assistant vice president and general sales manager. C. A. Butcher was named vice president for planning . . . General Cable's four new vice presidents are: M. H. McGrath, E. B. McGrew, H. G. Richardson, and August Wacker.

EEI President Sums Up Industry's Achievements

The Diamond Jubilee of the electric light was a notable one for the industry, declared Harold Quinton, president of Edison Electric Institute, in a year-end review and forecast statement.

The year, he said, was marked by such achievements as connection of the industry's 50 millionth customer in January, connection of the 5 millionth farm for electric service a few weeks later, and passing the 100 millionth-kw mark in generating capacity on Oct. 21.

New Capacity Sets Record . . . Quinton, who is also president of Southern California Edison Co, noted that 11.5 million kw of new capacity added in 1954 topped the previous high of 10.1 million kw in 1953. The new additions brought total generating capacity of utilities to about 107 million kw.

The EEI head forecast that this year's record additions would be exceeded next year when it is expected that 13 million kw will be added. These figures include additions by all segments of the electric industry. In 1955, investor-owned companies plan to add 8 million kw.

New technical developments also made 1954 an outstanding one for the utilities according to Quinton. He cited as examples the projected building of the first 5,000 psi and 1,200F steam boiler by Philadelphia Electric Co and the first 300,000-kw generator by Detroit Edison Co. And, in the nuclear power field, he pointed to the groundbreaking at Shippingport, Pa., for the nation's first full-scale power plant which will use atomic fuel.

Bigger Generating Units . . . Quinton noted that generating units on the average have doubled in capacity over installation made before the war. This factor has been important in keeping unit costs down, he said.

The EEI president pointed out that utilities continued to make gains in operating efficiencies during the year. Outstanding example of this, he said, was the fact that utilities produced 28 billion kwhr more than in 1953 with the same amount of coal. Quinton reported that coal consumption declined from 1.06 lb per kwhr in 1953 to 0.99 in 1954.

Total generation by all utilities was estimated at 471 billion kwhr for the year by Quinton. Industrial and railway plants increased this total by 73 billion kwhr to make power generation from all sources 544 billion kwhr.

In outlining future prospects of the electric industry, Quinton made these predictions:

- In 1965 demand for electricity will be double that of today.
- Three or fourfold increase in use of power is expected by 1975.
- Industry must plan to add from 7 to 12 million kw of new capacity each year between now and 1965 to meet power demands; after 1965 additions of from 11 to 24 million kw a year may be required.
- Generating plants using atomic energy as fuel will total 1 to 2 million kw of capacity within the next ten years and possibly 40 to 65 million kw by 1975 (out of a total of 301 to 423 million kw of generating capability).

In 1954, Quinton stated, investor-owned companies spent $2.8 billion on construction and plan a similar budget for 1955. (These

Quinton Reports on 'Notable' Year

Firsts

- 5,000 psi, 1,200F steam boiler ordered by Philadelphia Electric
- 300,000-kw generator ordered by Detroit Edison
- Groundbreaking for first utility-size nuclear power plant

Milestones Reached and Passed

- 50 million customers
- 5 million electrified farms
- 100 million kw in capacity

Record expansion

- 11.5 million kw added by all utilities
- $2.8 billion spent for construction by private utilities

Forecast for 1955

- Construction budget of $2.8 billion for private utilities
- Addition of 13 million kw by all utilities

totals are estimates made by EEI on the basis of statistics compiled by EW.)

Sales of electricity in 1954 increased 6.6% in 1954 over 1953, Quinton reported. Total figure for 1954 is 409.5 billion kwhr, an increase of 25 million over 1953. Sales to industrial customers showed a gain of 3.9%, residential sales were up 11.4%, and commercial sales increased 8.1%.

During the year, the utility president continued, 1.3 million customers were added, bringing the total to 51,-200,000. He estimated that about 98% of occupied homes, urban and rural, now are getting electric service. And farm customers at the end of this year stood at an estimated 5,090,000 or 94.6% of the over-all farm figure.

Quinton reported these statistics on residential consumption of electricity and cost of power to residential users:

- Average consumption of electricity in the home increased a record amount in 1954—194 kwhr over the 1953 figure. Average use by householder for 1954 was 2,540.
- Domestic consumers account for 26.4% of all electricity sales.
- In 1954 average price per kwhr to residential users declined from 2.74¢ to 2.69¢.

In his review statement, Quinton noted that regulatory commissions "continued to recognize the effects of postwar inflation on constructional costs and tax payments, through the approval of rate adjustments necessary to insure the financial strength on which continuance of adequate electric service to the nation depends." In 1954, he said, there were 39 actions by the commissions. Of these 22 requests for rate increases were granted, one was denied, and there are 16 pending.

Gross revenues of investor-owned electric companies, said Quinton, were $6.3 billion in 1954, an increase of 6.1% over 1953. Net income was $1,165,000,000, an increase of 11.9%.

Some big expenses for electric companies also increased, Quinton reported. Taxes in 1954 consumed $1,447,000,000 of operation revenues, or 23%. The tax bill for electric companies rose 8.1% over 1953. Federal taxes were $888 million, and state and local, $559 million. Wages and salaries also showed a gain of 6.2% over 1953. But fuel costs decreased 1.9%.

RALPH J. CORDINER GWILYM A. PRICE W. A. ROBERTS

Manufacturers Look Ahead to a Good Year

As the last days of a surprisingly prosperous 1954 drew to a close, leaders of the electrical manufacturing industry began peering ahead at the business prospects for 1955. Uniformly they foresaw a vigorous increase in new business ranging upward to 10% over 1954. Year-end statements by chief executives of the three major firms, General Electric Co, Westinghouse Electric Corp, and Allis-Chalmers Manufacturing Co were marked by cautious predictions that 1955 could be as good as 1953's record.

As for 1954 they credited a sharp upturn in new orders during the last quarter for wiping out effects of a slump in the early months and ending the year with business running second to 1953 by margins of 3 to 5%—defense business excluded. With defense business included 1954 fell behind the 1953 record by substantial margins.

General Electric Prospects . . . Speaking for General Electric, at his year-end press conference, President Ralph J. Cordiner said business in the first nine months of 1954 was off 7% but may end the year off 5% compared with 1953. The slippage was in defense business which at GE was off 20% this year. Eliminating defense products, Cordiner said GE may end the year as much as 3% ahead of 1953. On the same basis in 1955 the dollar volume of new business will top 1954 by an estimated 5 to 8%, he predicted, with each quarter in 1955

better than any three months' period this year.

Consumer goods will, Cordiner said, show as great an increase as any of GE's product lines next year. Heavy apparatus, where lead time is great, will show the smallest increase in sales billed and may show a decrease in 1955 over 1954. He pointed out, however, that turbine business in the 3 months ended Nov. 30 of this year equalled the first 8 months. This fact was taken as an indicator that transformer and switchgear lines would have an active year in 1955 as orders for such products follow turbine orders. However, Cordiner warned that it might not be so active as 1954 on a sales billed basis because electric utilities have been out of the market for about six months.

Next year GE expects to spend more for expansion of its facilities and laboratories than it has in any year since before World War II. In 1954 the company spent $60 million. In 1955 it is planning to spend $65 million.

Looking at the outlook for the electrical industry as a whole, Cordiner saw business very much on the upsurge and nothing in sight that will change that trend. He confidently predicted that the industry would double in the next ten years. For GE he foresaw twice as much business in 1964 in terms of 1954 dollars as the company will produce this year. "GE is blessed," Cordiner said, "being in the electrical industry."

Westinghouse Outlook . . . Gwilym A. Price, president of Westinghouse Electric Corp, another similarly blessed arm of the electrical industry, saw prospects of general stability and gradual improvement in the national economy ahead in 1955.

By the end of 1954 Price said his firm will have shipped a record $1.6 billion of goods in 1954. However new orders excluding defense business will be off 5% for the year compared with 1953.

Price anticipates an increase of some 10% in orders in 1955. Taking account of the upswing of business during the last months, he expects Westinghouse sales billed next year to approach or equal 1954's record.

By mid-1955, Price said, Westinghouse will complete the $300 million expansion program launched in 1950 that has increased productive capacity 125% since the end of World War II. Upon completion of this program, Westinghouse will embark on a continuous expansion program amounting to about $50 million a year.

Price predicted that air conditioning, for which Westinghouse has built a large new plant this year, will see a 1,000% increase in the next decade. In the next five years Price said he expected that more than 428 million appliances would be built by the industry.

He also foresaw a doubling in electric power demand in the decade ahead and a growing demand for power generating and distributing apparatus. "The long term future of the electrical industry looks bright indeed", he said. "And though the short time future is hard to predict I look forward to general stability and a gradual improvement in the national economy."

As Allis-Chalmers Sees It . . . W. A. Roberts, president of Allis-Chalmers sees 1955 as a relatively stable year without any wide fluctuations in sales. For the year just closing, company sales billed will be approximately 5% below 1953 records, he estimates. Roberts' general view now is that the market for electrical and construction equipment should be at least as good as it was this year. Specifically, he expects transmission and distribution business to equal 1954 with good signs for improvement. The expectation is that heavy equipment business will follow the same active trend of the past six months of 1954. However, Roberts does not see any factors at present that would indicate that the market for farm equipment in the coming year will be any greater than it was during 1954.

Wisconsin PS' Weston Plant Is Operating

Wisconsin Public Service Corp's new 60,000 kw power plant in the town of Weston on the east shore of the Wisconsin River has been placed in operation. The building, together with its generating equipment, substation, 115,000-v transmission line, and auxiliary equipment, will cost $11 million. The Weston Plant, clad with metal siding of exterior ribbed aluminum, brings total Public Service generating capacity to 325,000 kw.

Failure at Commonwealth Edison plant destroys turbine ➡ and damages three other units and plant structure

Ridgeland Plant Rocked by Explosion

An explosion in the low-pressure turbine of a new 150,000-kw cross-compound, steam turbine-generator unit at Ridgeland Station of Commonwealth Edison Co, at Stickney, Ill., occurred Sunday, Dec. 19, at 11:19 PM as the unit was being brought into service. The blast destroyed the turbine, and flying metal and debris caused considerable damage to the station building and adjacent units. Two men were killed and five others injured in the accident that knocked the station out of operation.

Ridgeland Station's 600,000 kw represents upwards of 18% of Commonwealth Edison's generating capacity of 3,422,000 kw. Its loss made it necessary for the company to ask 100 of its largest customers to cut load by 25%.

Unit Went on Line in August . . . The unit involved in the blast was the latest of four similar units at Ridgeland, having been placed in service in August this year. It consists of a 50,000-kw 3,600-rpm high-pressure and a 100,000-kw 1,800-rpm low-pressure element, normally operated cross compounded. Steam is supplied to the unit from a single boiler at a throttle pressure of 1,800 psi, 1050 F. The low-pressure element of the unit has an intermediate as well as a low-pressure turbine on its shaft.

It was in the low-pressure turbine that the failure occurred. This led to an explosion, but no fire followed. No cause has yet been determined. The unit was operating at close to normal speed at the time of the failure.

Replacement Will Take Months . . . The blast destroyed the 100,000-kw low-pressure, 1,800-rpm turbine, and Edison spokesmen said that it would probably be several months before it could be replaced. The high-pressure, 50,000-kw, 3,600-rpm machine is believed to have suffered relatively minor damage.

Damage to the building included holes in the roof of the turbine room ranging in size from 1 to 50 sq ft. Flying debris also drove several holes in the plant walls. The reinforced concrete floor was broken in a few places by heavier turbine fragments falling through it.

A substantial portion of the estimated damage to the plant and equipment is covered by insurance and by the guarantee of the manufacturer, the Allis-Chalmers Manufacturing Co.

Two of the three remaining 150,000-kw units in the station were returned to service on Tuesday following the accident, and the third was returned to service early Wednesday. Interconnections with neighboring systems made it possible for the company to secure 200,000 kw of generating capacity and to carry the load of its normal winter peak week with a minimum of curtailment in service. Such curtailment of service as there was ended at 8:30 PM Tuesday, a utility spokesman stated.

As yet no official estimate of the damage to the plant and equipment has been made pending complete and detailed examination of the equipment affected, however it is believed to run to a total of several million dollars.

A spokesman for Allis-Chalmers said, "We have placed all of our facilities and technical resources at the disposal of our engineers who are working with Commonwealth Edison engineers in a complete investigation of the accident. Until the results of their investigations are available, we do not think that it is timely for us to comment."

Trade Law Change

'Buy American' rules eased by President. Traditional 25% preference for U. S. firms is cut

President Eisenhower took a long step forward toward scuttling the "Buy American" regulations which have limited federal government purchases of foreign goods—particularly heavy electrical equipment.

By administrative directive the White House cancelled out the effect of the 1933 law designed to channel government buying to domestic producers. New ground rules provide that foreign bids, excluding tariff, need be only 10% under American bids to compete successfully. If tariff is included in the foreign bid, the bid need be only 6% less than American bids in order to compete.

Result is that the traditional 25% "Buy American" preference has been whittled away entirely, and the tariff barrier has also been trimmed under the new rules.

Changes Linked to GATT . . . The White House move came at a time when U. S. representatives were negotiating changes in the organization of the General Agreement on Tariffs and Trade, an international group dedicated to lowering world trade barriers. The move was designed to strengthen the U. S. stand at the conference being held in Geneva.

The Buy American Act was enacted in the 1933 depression to shield hard-pressed U. S. industry from foreign competition. It required the government to buy from U. S. suppliers unless their prices were "unreasonable." In practice, federal agencies for years awarded contracts to domestic suppliers unless their bids were 25% or more above the lowest foreign bid.

Sporadic efforts have been made to liberalize Buy American practices, and a number of contracts have gone to foreign bidders in the last few years whose bids were less than 25% under the lowest American bids. But there has been no standard procedure from agency to agency or from contract to contract so the 25% rule has continued to apply in most cases.

All U. S. Agencies Affected . . . The new rules set up standard procedures for all government agencies. They also lower the price preference given domestic bidders to either 6 or 10% depending upon whether or not tariffs and handling charges are added to the foreign base bid before or after calculating the Buy American differential. In practice, the differential in most cases will be around 10%. That means that an American supplier whose price is 10% or more above the lowest foreign bid before the tariff, in principle, would lose the contract.

Several concessions were thrown to domestic bidders on government contracts by the President, however.

- Federal agencies will be permitted to place what is called a fair proportion of their orders with U. S. small businesses.
- The government may reject foreign bids for security reasons, or in the "national interest."
- Agency heads may throw contracts to low American bidders in surplus labor areas—if the President decides that it is in the national interest.
- An agency chief can ignore the new price differentials, but he will have to explain why to the President in writing.

The new Buy American order came only after a long behind the scenes debate within the Administration. Eisenhower announced last March his intention of liberalizing Buy American procedures. Since then they have been debated a number of times by the cabinet without reaching a final decision. The White House was on the verge of issuing the new order last month but renewed protests from affected domestic producers delayed it once more.

The White House stuck by its guns and pushed Buy American liberalization. So you can expect Eisenhower will push hard for the rest of his trade liberalization program.

U.S. Atom Exhibit Gets N.Y. Showing

Largest and most complete U. S. government exhibit ever devised to explain basic principles of atomic energy and its peacetime uses was given its only public showing in this country at Hunter College, New York, earlier this month. Dr George N. Shuster, president of Hunter College, is shown pointing to a nuclear power station model in the exhibit. Onlooker is Whitney Stone, left, president of Stone & Webster, Inc.

Prepared by the U. S. Information Agency, the "Atoms for Peace" presentation is one of two identical exhibits that will be shipped to the Far East and Middle East. The exhibit, comprised of about 350 linear feet of animated panels and models, covers all phases of peaceful atomic energy development. The showing at Hunter was sponsored by the Atomic Industrial Forum.

World Atom Group Organized

Establishment of international unit to develop peaceful uses of nuclear energy is revealed by Cisler, its president

The Fund for Peaceful Atomic Development, Inc, a private international program to develop the peaceful uses of atomic energy, was announced last Monday by Walker L. Cisler, president of Detroit Edison Co and president of the newly organized Fund.

The nonprofit organization will be the first nongovernment operation to carry out the objectives of the Atoms-for-Peace Program of President Eisenhower. But where the President's international atomic plan contemplates arrangements between governments, the Fund's activities will emphasize people-to-people, industry-to-industry, and science-to-science cooperation on a worldwide basis.

Cisler said the Fund will supplement the peaceful international atomic program, and will make its contributions in those areas not touched by government activity and areas where government may find a supporting private organization useful.

Said Cisler: "Only with a private organization supplementing the work of our government can the available talent throughout the world be mobilized in a maximum effort to bring into reality the beneficial uses of the atom. The Fund seeks to put to work all of the private resources available in this country and abroad so as to improve the welfare of men and women throughout the world and raise their living standards by means of atomic energy."

Plans Task Forces . . . In its initial operations the Fund will arrange for task forces of leading industrialists, scientists, and other individuals from foreign countries to visit the U. S. These task forces will survey unclassified aspects of the efforts both by private groups and the U. S. Government to harness the atom for peaceful purposes. Such surveys will cover all phases of peaceful efforts.

The Fund plans to study the need for peaceful applications of atomic energy in other countries, as well as the capacity of such countries to utilize atomic energy. It will also provide an international clearing house of unclassified atomic energy and promote the dissemination of all such information pertinent to the beneficial uses of the atom. Scholarships for study and research will be provided.

The Fund's sponsors hope that a permanent private international organization may soon be created.

Cisler, who recently met and discussed atomic problems with industrialists, scientists, and engineers in 12 European and Middle East countries, said the Fund's directors are confident they can locate businessmen, scientists, political leaders, and others in foreign countries who will wish to form groups dedicated to peaceful development of the atom.

Fund's Officers . . . Officers of the Fund, in addition to Cisler, are: Vice President, William C. Foster, president of the Manufacturing Chemists' Association and a former Economic Cooperation Administration administrator; secretary, Oscar M. Ruebhausen, a partner of Debevoise, Plimpton & McLean and chairman of the Atomic Energy Committee of the New York City Bar Association; treasurer, Joseph M. Dodge, chairman of the Detroit Bank, special assistant to the President on foreign economic policy and former Budget director.

The Fund will have offices in Detroit and New York.

The Fund's distinguished list of directors includes: Robert F. Bacher, director of the Norman Bridge Laboratory at the California Institute of Technology and former Atomic Energy Commission member; Prentiss M. Brown, former U. S. Senator from Michigan, and former Detroit Edison board chairman and now chairman of the Mackinac Bridge Authority; Chester Bowles, former ambassador to India; William A. Calvin, international president of the American Federation of Labor Brotherhood of Boilermakers; Arthur H. Dean, partner of Sullivan & Cromwell; Dr John R. Dunning, dean of engineering at Columbia University; William T. Gossett, Ford Motor Co vice president; Paul G. Hoffman, chairman of Studebaker-Packard Corp; C. D. Jackson, vice president of Time, Inc, and U. S. representative to the General Assembly of the United Nations; Philip D. Reed, chairman of General Electric Co; David Rockefeller, senior vice president of Chase National Bank; Hartley Rowe, vice president of United Fruit Co; E. Blyth Stason, dean of the law school of the University of Michigan and chairman of the American Bar Association's Committee on Atomic Energy; William Webster, executive vice president of New England Electric System and president of the Yankee Atomic Electric Co; and Theodore P. Wright, president of Cornell Aeronautical Laboratory.

The Fund was formed Oct. 18 under New York State laws governing such non-profit organizations.

Its initial, and so far only, financing comes from Ford Foundation, which is turning over to the Fund $150,000. Of that, $75,000 is immediately available; balance will be paid out over next three years. Cisler expects other financing to come forth through the efforts of the directors, who have been instructed to solicit funds from individuals and groups who have interests in such projects.

Fund will have a professional staff, selection of which is now underway. In addition to an executive manager, there will be five directors who will be concerned with the following phases of activity: Technological, economic, governmental, educational, and management aspects.

MEETINGS

Complete listing of meetings appears in last issue of each month.

NORTHEASTERN WEED CONTROL CONFERENCE

Annual Meeting, New Yorker Hotel, New York, Jan. 5-7, 1955.

PUBLIC INFORMATION PROGRAM

West North Central Region, Martin Hotel, Sioux City, Iowa, Jan. 6; Workshop Conference Committee, Blackstone Hotel, Chicago, Jan. 14; Mid-Atlantic Region, Seaview Country Club, Absecon, N. J., Jan. 21, 1955.

ELECTRICAL EQUIPMENT REPRESENTATIVES ASSOCIATION

Annual Meeting, Breakers, Palm Beach, Fla., Jan. 10-12, 1955.

NATIONAL ASSOCIATION OF PURCHASING AGENTS

Third Region, Jefferson Hotel, St. Louis, Jan. 13-14; 24th Annual Mid-Winter Conference, Public Utility Buyers' Group, Shamrock Hotel, Houston, Tex., Feb. 13-15, 1955.

(*Continued on page* 108)

Courts Dismiss Suits

Federal district courts in Seattle and Tacoma have dismissed two condemnation suits in which the Kitsap County Public District sought to take over the properties of the Puget Sound Power & Light Co. The motion to dismiss was made by the District, Puget's Pres Frank McLaughlin announced.

FINANCIAL BRIEFS

Monongahela Power Co has asked Federal Power Commission approval to acquire the transmission and distribution facilities of Clinchfield Coal Corp and its subsidiary, Fairfax Electric Co, for $35,000.

Philadelphia Electric Co has received Public Utilities Commission approval to exchange $1,277,000 worth of street lights it now owns with the City of Philadelphia for $1,278,099 worth of underground cable, wiring, and ducts now owned by the city.

REGULATION BRIEFS

Central Maine Power Co has received Public Utilities Commission approval to raise rates about $1.1 million a year (4½%) . . . **Scranton Electric Co** has been authorized by the Pennsylvania Public Utilities Commission to increase rates $804,956 a year as compared with $1,201,315 a year requested . . . **Colorado Springs, Colo.,** Department of Public Utilities has asked the City Council to approve a 1955 budget that sets an estimated 11% increase in electric and gas rates to retail customers . . . **Oklahoma Gas & Electric Co** has received Arkansas Public Service Commission approval to increase rates $213,000 a year which became effective with the Dec. 10 billings . . . Expecting an increase in Bonneville Power Administration rates, the **Tacoma, Wash., Public Utilities Board** has changed the date for the adjustment of nine major industrial contracts from Jan. 1 to April 1, 1955.

Today in Utility Finance

YIELDS (%)

Quality	Bonds			Preferred Stocks			Common Stocks		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
DATE									
Dec. 16	**2.89**	**2.93**	**3.10**	**3.90**	**4.04**	**4.36**	**4.36**	**4.70**	**5.23**
Dec. 9	2.88	2.90	3.10	3.88	4.04	4.37	4.37	4.76	5.23
END OF QTR.									
3rd 1954	2.88	2.90	3.10	3.89	3.99	4.38	4.50	4.80	5.19
2nd 1954	2.90	2.96	3.19	4.03	4.14	4.48	4.72	5.04	5.45
1st 1954	2.82	2.87	3.14	3.88	4.09	4.42	4.83	5.19	5.42
4th 1953	3.07	3.12	3.34	4.17	4.32	4.62	5.07	5.57	5.51

Data: Reis & Chandler, Inc.

EARNINGS

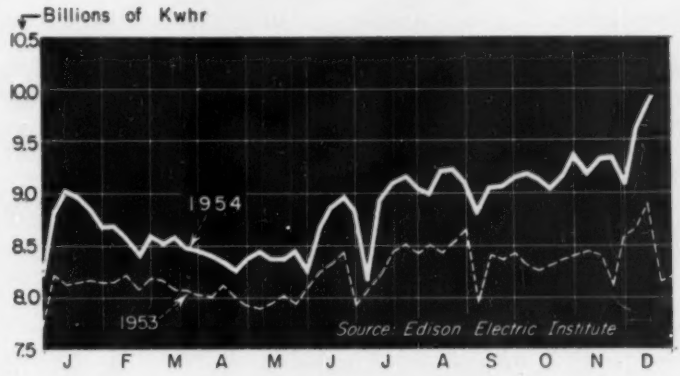
Company	Period Months	Ended	Net Income 1954	Net Income 1953	Earnings per Common Share 1954	Earnings per Common Share 1953
British Columbia Power Commission	12	Mar.	$177,572(a)	$393,670(a)	$....	$....
City of Los Angeles—Department of Water & Power	12	June	19,521,691	16,869,323	....	....
Southern Canada Power	12	Sept.	1,545,985	1,441,759	2.62	2.36
Southwestern Public Service	12	Aug.	7,674,362	6,709,739	1.75(b)	1.64(b)

Notes—Figures for the above have been audited. (a) Net surplus transferred to stabilization reserve; (b) Without giving effect to accelerated amortization, per share earnings on the common stock outstanding at the end of the respective periods would have been $1.46 for the 1954 fiscal year and $1.48 for the 1953 fiscal year.

FINANCING

Company and Description	Amount of Offering ($000)	Offering Price	Yield to Public
WEEK OF DECEMBER 16-22			
Bonds			
New York State Power Authority—3.20% revenues due 1995	$268,000	100%	3.20%
New York State Power Authority—revenues due 1965-76	67,000	various	2.10-2.75%
SCHEDULE FOR JANUARY—FEBRUARY			
Bonds and Debentures			**Bid Date**
Duke Power—1st mtg due 1975	$40,000	.....	Jan. 10
Commonwealth Edison—conv. debs	50,000	.....	Jan. 11
New England Power—1st mtg due 1985	25,000	.....	Jan. 18
Consumers Power—1st mtg due 1990	30,000	.....	Jan. 25
Los Angeles, Calif., Department of Water & Power—electric plant revenues	18,000	.....	Jan. 26
Dallas Power & Light—debs due 1980	7,000	.....	Feb. 14
Kansas City Power & Light—1st mtg due 1985	16,000	.....	Feb. 15
Texas Electric Service—1st mtg due 1985	17,000	.....	Feb. 23
Western Light & Telephone—1st mtg due 1985	3,000	.....	.....
Preferred Stock			
Patchogue Electric Light—750 sh $1,000 par	$750	.....	.....
Public Service Electric & Gas—250,000 sh $100 par cum	25,000	.....	Jan. 11
Duquesne Light—160,000 sh $50 par	8,000	.....	Jan. 20
Common Stock			
Duke Power—218,737 sh (to be offered commonholders on 1-for-20 basis, record Jan. 12 to expire Jan. 28; no underwriting)	$8,749	$40.00	5.00%
Western Light & Telephone—about 40,000 sh (to be offered commonholders on a 1-for-10 basis)	.....	.....	.....
Duquesne Light—450,000 sh	.....	.....	Jan. 17
ISSUES RECENTLY POSTPONED			
Bonds			
Gulf States Utilities—1st mtg due 1984	$24,000	.....	.....
Consolidated Edison Co of N. Y.—1st mtg due 1984	50,000	.....	.....
Preferred Stock			
Gulf States Utilities—160,000 sh $100 par cum	$16,000	.....	.....
UNSCHEDULED AND/OR UNDER CONSIDERATION			
Bonds and Debentures			
Kentucky Utilities—1st mtg	$15,000	.....	.....
Southern Nevada Power—1st mtg	5,400	.....	.....
Southern Nevada Power—debs	1,000	.....	.....
Preferred Stock			
Public Service Co of Oklahoma—100,000 sh $100 par	$10,000	.....	.....
Southwestern Gas & Electric—60,000 sh $100 par	6,000	.....	June 1
Common Stock			
Kentucky Utilities—about 288,678 sh (to be offered commonholders on about 1-for-10 basis)	.....	.....	.....

STATISTICS



Output Week Ended Dec. 18—9,909,000,000 Kwhr

Per Cent Change from Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Dec. 18	+11.4	+6.0	+5.1	+8.7	+4.3	+19.9	+11.4	+12.2	+11.6	+7.5
Dec. 11	+13.7	+10.1	+7.8	+10.5	+5.0	+26.2	+12.5	+8.9	+8.8	+9.0
Dec. 4	+12.0	+7.2	+5.0	+8.5	+2.6	+23.9	+10.1	+8.8	+9.9	+10.9

Seasonally Adjusted Index† —179.0 Week Ago 179.9 Year Ago 160.7

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load ‡(Million Kw)	Oct.	79.9	79.4	74.0
Capacity (Million Kw)	Oct.	100.01	99.16	88.62
Production (Billion Kwhr)	Sept.	39.55	41.17	37.03
Hydro	Sept.	7.80	8.34	7.59
Fuel	Sept.	31.74	32.82	29.44
Fuel Consumption				
Coal (Million Tons)	Sept.	9.73	9.83	9.67
Oil (Million Barrels)	Sept.	4.90	4.85	6.16
Gas (Billion Cu Ft)	Sept.	118.62	130.49	105.14
Sales (Billion Kwhr)	Oct.	33.75	34.05	32.21
Residential	Oct.	9.70	9.76	8.70
Commercial	Oct.	6.40	6.69	5.62
Industrial	Oct.	15.24	15.00	15.56
Other	Oct.	2.41	2.60	2.33
Net Income Class A & B Companies ($ Million)	Sept.	92.41	89.43	80.66
Estimated Dec. '54 Peak ‡(Million Kw)	Sept.	87.8	88.0	91.2
Kwhr per Residential Customer (12 Month Average)	Sept.	2,496	2,476	2,302
Revenue per Kwhr Residential Service (12 Month Average)	Sept.	2.70¢	2.71¢	2.75¢
Canadian Production (Billion Kwhr)	Sept.	5.51	5.45	5.09

Business Statistics

FRB Industrial Production Index†	Nov.	130	130	130
Gross National Product Annual Rate ($ Billion)	3rd Qtr.	355.5	356.0	367.2
EW 4 Industry Production Index†	Oct.	116.6	116.0	124.0
ENR Construction Cost Index††	Dec.	134.9	134.8	128.2
BLS Consumer's Price Index	Oct.	114.5	114.7	115.4
NEMA Insulation Materials Sales Index†	Sept.	123	111	153
NEMA Electric Appliance Sales Index†	Sept.	115	91	102
NEMA Household Refrig. Sales Index†	Sept.	73	71	62
Metal Prices (Dec. 21)				
Copper, Conn. V., lb		30.0¢	29.7¢	29.7¢
Lead, N. Y., lb		15.0¢	15.0¢	13.5¢
Zinc, prime Western E. St. Louis, lb		11.5¢	11.5¢	10.0¢
Tin, Straits, qual. N. Y., lb		86.0¢	90.8¢	84.8¢
Aluminum, ingot, base price		2.2¢	22.2¢	21.5¢
Nickel, base price		64.5¢	64.5¢	60.0¢
Steel, billets, Pitts., ton		$64.00	$64.00	$62.00
Steel, scrap, No. 1 heavy, Pitts., ton		$32.00	$34.00	$35.00

*Preliminary **Revised ‡Class 1 Systems †1947-49=100 ††1949=100

Nation's Peak Load Ups 8% a Year Since 1939

At the season of the year which has traditionally marked the heaviest load on the nation's electric systems, and in this year with colder weather and darker days bringing about new output records every week, it seems particularly appropriate to discuss system peaks and trends in the rates of growth of peak loads.

Using data from the Federal Power Commission's reports on system loads for regional power supply areas, Edison Electric Institute studied the period from 1939 to 1953. The results show a growth that has been exponential. For the United States as a whole, the rate of growth was 8.1%. It was 7.5% for the period from 1932 to 1953, and 6.4% from 1920 to 1953.

Region	*Rate of Growth*
Northeast	5.8%
East Central	7.6
Southeast	10.5*
North Central	7.4*
South Central	11.3
West Central	13.2**
Northwest	10.6
Southwest	8.4
United States	8.1*

*Not including Paducah AEC load
**Data adjusted to agree with present regional groupings.

EEI noted that the main limitation of their analysis lay in the nature of the period studied with regard to the particular economic conditions involved. The rates of growth indicate a cyclical phase of expansion present during the war and post-war period. The lack of a counter-balancing element then tends to inflate the rates.

Region	*Relative Weight 1939*	*Relative Weight 1953*
Northeast	32.4%	24.1%
East Central	20.2	18.9
Southeast	12.0	16.3
North Central	13.7	12.5
South Central	5.5	8.2
West Central	1.0	2.0
Northwest	9.0	9.4
Southwest	6.2	8.6
United States	100.0	100.0

Examining the regional rates of growth reflects considerable diversity, and certainly the need for adequate facilities to meet expected increases. A comparison of the relative weights of the trend values in relation to the national summary for 1939 and 1953 bears this out even more.

WASHINGTON COMMENT

Prospect is bright for electric company development of the Hells Canyon stretch of the Snake River in Idaho. Idaho Power Co has two and possibly three more hurdles to clear before beginning construction on its proposed three-dam development, but the tide appears to be running in its favor.

FPC Report on Hells Canyon Is Key to Decision

The turning point came with the filing of the Federal Power Commission staff recommendations (EW, Dec. 6, p 7) although there had been previous signs that the public power opposition to private enterprise development had been losing steam. The alternative of a federally financed high Hells Canyon dam had failed to gain a nod from two Democratic Congresses, and the once-enthusiastic public power coterie in the Interior Department failed to gain national endorsement in the 1952 Presidential elections.

Staff Report Is Key . . . But it is the well-reasoned and carefully assembled FPC staff report that will be a key document in Idaho Power's final drive to get a federal license for its development. Experts who have studied these findings and recommendations feel certain the report will persuade the presiding examiner and later the full 5-man commission that the company plan provides the most reasonable, the most economic, and the most comprehensive development of the river basin.

Fact that the staff recommendations are generally in line with the Eisenhower power policy will be an asset when Idaho Power goes before the full commission. After all four of the five commissioners either owe their appointments to the Administration or have expressed sympathy with Administration power views. The attitude of the individual commissioners will be important when the decision is written.

But the engineering and legal staff did not follow a partisan line in writing its report, and the commission cannot justify a decision purely on a partisan basis. It is the engineering and legal findings that are the heart of the report and which must be depended on to sway the commission.

Hard Look at Costs . . . The staff report estimates the construction costs of the three-dam development at $176 million—$43 million above Idaho Power's estimate. Company officials are convinced this is considerably on the high side. In comparing the company plan with a high federal dam, the staff took the minimum figure for the high dam and the maximum conceivable figure for the company development. Yet the staff was able to find in favor of the company development.

The staff also concluded that the company development would offer all of the fringe benefits that are claimed for the federal project. Among these are recreational sites, fish protection, flood control, and navigation.

In its recommendations the FPC staff took precaution to protect the public interest in every conceivable way. A long list of stipulations which the Interior Department had requested be written into any license were accepted by the staff and written into the recommendations. Among these were: That output of the Hells Canyon development be coordinated with the Northwest Power Pool. That construction be paced so as to meet power demands in the area. That fish and wildlife protection be adequately provided.

These stipulations and others offered by Interior had a political tinge in that the Administration wanted to make sure that no substantial charge could be made that public interest would not be fully protected under private development.

To meet one of them, the FPC staff recommended that the largest and most expensive of the three dams in the company development be constructed first and that all three be completed in a specified length of time.

The staff report becomes the first independent report of its kind made after opposing parties have submitted all their evidence. For that reason alone it has a standing unmatched by any other available reports.

It adds up to this: The FPC examiner and the commission, itself, would have tough sledding in attempting to override the staff recommendations in this case. From what is known of the general attitude of the commissioners, there is reason to believe that a majority will find the report in harmony with their individual views.

TECHNICAL NOTES

ARCHER E. KNOWLTON

Isolated phase bus with insulators spaced 8 ft apart was tested with 350,000 amp rms, but even then load on insulators was 26% below the breaking load of the insulator assembly. Explanation is the shielding effect of the metal enclosures.

Cadmium is resistant to tarnish and corrosive influence and does not seriously attack aluminum or promote subsurface galvanic action according to its advocates for plating aluminum in connector application.

Protection against overspeed is the most important protection of a turbine-generator unit because lack of it could permit a catastrophe within seconds after loss of load on the generator.

Losses in the transformers at turning gear speeds are usually high enough to prevent one of the two compound units from motoring the other when both are connected to the same bus.

Metals and semi-conductors would conduct much better than they do if the curvature of electron paths in a field were cumulative. As it is, each collision undoes the curvature acquired in the preceding free run; and there is no cumulation of effect.

Alpha emitter polonium 210 ionizes air in air-conditioning systems without affecting the temperature, relative humidity, or velocity of the air nor producing ozone, oxides of nitrogen, or hydrogen peroxide.

Maximum overspeed of a reheat turbine could reach 15-17% over rated speed if an intercept valve should fail to open. Either of two reheat stop valves in parallel can be tested to fully closed position while unit is carrying load.

1954 Year-end review and predictions for 1955

a report by the editors

john j. kearney middle eastern editor

generation made big strides in 1954

Nuclear and supercritical pressure power plants were the big news in 1954. This year ground was broken for a 60-Mw nuclear power unit, orders were placed for a 275-Mw supercritical pressure unit and the world's largest turbogenerator, a revised atomic energy bill was enacted, and the Atomic Energy Commission inaugurated a 5-yr atomic power program.

Steam . . . The Philadelphia Electric Co announced plans to build a 5,000 psi, 275-Mw plant.[1] This new unit will have a net plant heat rate of 8,400 Btu per kwhr, an initial steam temperature of 1,150F, and two reheat cycles both at 1,050F.[2] Steam generation attained another first with Detroit Edison Co's announced commitment for a subcritical-pressure (2,400 psi) 300-Mw unit with one stage of reheat.[3] This will be the world's largest unit although manufacturers indicate readiness to build units up to 500 Mw when users are ready.[4]

Although supercritical pressure and nuclear power plants indicated a departure from established design practices, the bulk of new power plants in 1954 were actually designed along conventional lines. This signifies a spirit of conservatism and not stagnation in power plant practices. Trends started in 1953 were continued in 1954. These included forced circulation, recirculation of combustion gases, and pressurization of combustion spaces. Unit design, outdoor arrangement, and the reheat cycle have become confirmed features of most of this year's new power plants. The reheat cycle was in use this year in all sections of the country, even in the relatively low cost fuel areas of the West South Central. Other techniques that gained a stronger foothold were demineralization of feed water makeup and the use of outdoor condensers.[5]

There were comparatively few startling developments in the electrical end of the power plant but rather intensified application of practices developed during the past few years. One main power transformer per turbogenerator continued to be the rule in most of the newly designed plants with the generator connected directly to the main power transformer. Unit design was also indicated by the use of only one 3-phase auxiliary power transformer connected directly to the generator main leads. Some type of stator and rotor temperature indication was used. Hydrogen pressures of at least 30 psi were used, some plants using as high as 60 psi. Functionally designed control boards were extended to many 1954 power plants. Centralization this year was still the favored trend in control with most utilities. Control rooms continued to be well lighted with luminous ceiling lighting; air conditioning and soundproofing have been adapted in several instances.[6]

Steadily rising cost of construction has put pressure on designers to reach for tricks, large or small, to keep the cost per kw at levels not much above those of 20 years ago. Some utilities resorted to new fuels or modified methods of preparing fuels. One plant was designed to burn river bottom anthracite coal recovered by dredging a river.[7] Another plant was designed to burn lignite. The economy of the lignite burning plant will be improved by the sale of tars obtained by processing the lignite before it is burned.[8] Other companies derived economies at the other end of the boiler plant by selling fly ash. One utility sold slightly over a quarter of its fly ash production at a price of approximately $1 per dry ton.[9]

Scant water supply for condensing purposes this year plagued utilities in selecting their plant sites. One solution used was to supplement river water, during periods of low flow, with cooling tower facilities.[10] Complete dependence on cooling towers was another solution used. An Electrical World Survey indicated that cooling towers cost broadly $4.45 per kw of generating station capacity.[11]

The year unfortunately was not without accidents in the generating field. Four generator failures occurred in 1954, two apparently similar generator explosions on the Hydro-Electric Power Commission of Ontario's system,[12] one in a manufacturer's test pit,[13] and one at Philadelphia Electric's Cromby plant.[14] The latter two were rotor body failures.

Nuclear . . . Sizable strides were made in the technology of producing electrical power from nuclear fission. Its use for power generation became a reality with the launching of an atomic powered submarine.[15] The size of the plant is small, but the designers believe its pressurized water reactor will set the pattern of industrial nuclear power.[16]

Duquesne Light Co and the AEC also decided to use a pressurized water reactor for their utility-size project. Slightly enriched uranium will be used for fuel in a reactor cooled and moderated by light water. Steam pressure will be 600 psi, and about 60-Mw useful electrical energy will be produced. Conventional types of steam, electric, and auxiliary equipment will be used. The plant will be de-

signed for refueling with minimum shutdown and simplified reactor control. Concrete will be used for shielding. With the arrangement the plant designers hope to cut down construction and operating costs.[17] Ground was broken for this plant on Labor Day, Sept. 6, by President Eisenhower. The 400 acre site is located at Shippingport, Pa., 25 miles northwest of Pittsburgh.[18]

1954 saw the AEC announce a 5-yr atomic power program aimed at developing reasonable priced electricity from nuclear power. This program was developed and written at the direction of Congress. Plans for building four reactors, in addition to the PWR mentioned above, were unveiled by the agency. Plans contemplate eventual construction of breeder, boiling water, homogenous, and sodium-graphite reactors.[19]

Included in the 5-yr plan was an AEC-Army sponsored "package" reactor with a capacity of about 2,000 kw. The package reactor will be designed so that it can be dismantled for air shipment to remote Army bases.[20] Thirty-three companies or groups were asked to submit bids.[21] The contract was awarded to the low bidder of $2 million.[22]

Industry's quest for nuclear knowledge was further satisfied when the AEC opened its materials testing reactor for press inspection this year. Although small, the unit has a very high thermal neutron flux density. Information gained testing materials for future power reactors is expected to accelerate the nuclear power program.[23]

New Law . . . Measures to get the new atomic industry off the ground were strengthened by the revised atomic energy law.[24] The 1954 law permits private industry to produce and use nuclear material under AEC license, encourages nuclear research, and even allows export of power or experimental reactors under AEC license. Moreover it permits easier, quicker disclosure of nuclear information. Other provisions require AEC to give public bodies and rural electric cooperatives priority in the purchase of AEC generated power from nuclear sources. Under the act, AEC may conduct research for outsiders if personnel and facilities are available.[25]

Experts emphasized the time consuming work required to implement this statute. Some of the chief problems discussed by the experts were definitions of "production facility" and "utilization facility," relationship between charges for issuing special material and prices by AEC for special material produced by licensees, establishment of classified information, and classification of patents.[26]

Plans were also laid for additional small reactors. Among the planned reactors are a research reactor at Armour Research Foundation,[27] another at Massachusetts Institute of Technology,[28] and a liquid metal fuel reactor by AEC.[29]

Progress made was very good considering the complexity of the problems of radioactivity.[30] Experts have been admitting that the high cost of insurance along with the problems of waste disposal are other obstacles yet to be solved.[31]

Hydro-Generation . . . Although most of the year's big news dealt with nuclear and steam generation, hydro-generation progress was not to be overlooked when the events of 1954 were considered. Hydro-generation improved not by the use of larger units or higher heads, but rather by broadening the pump-storage concept. Introduction of the pump-turbine permitted pumping of water into a storage or irrigation reservoir during off-peak periods and using the elevated water to drive the turbine during periods of large energy demand. This reversible hydraulic machine is capable of operating at high efficiency as either a turbine or a motor-driven pump.[32]

Gas Turbines . . . Plant efficiency was improved by adding a gas turbine to an existing steam turbine plant. Application of a combustion gas turbine to the steam cycle increased plant thermal efficiency about 15%.[33]

This year saw the gas turbine art further advanced by introduction of a 4,500-kw mobile gas turbine power car for the Navy. The mobile unit was installed upon a specially designed freight car which allows speeds up to 60 miles per hour.[34]

power plant and practice in 1955

Unit as large as 500 Mw an early possibility; 250 Mw already established.

Stepped-up plant economy to come from higher temperature, pressure, and repeated reheat.

Still another supercritical pressure unit will be initiated with still higher temperature and pressure.

One or perhaps two additional nuclear power plants, probably with a breeder type of reactor.

Higher level steam cycles will put premium on clean water and steam.

Outdoor design spreading in area.

Sites and apparatus will have to respond to programs directed at alleviating air pollution.

Use of stack gases to drive a gas turbine will be studied.

Internal cooling of stator and rotor conductors, higher hydrogen pressures for more and more generators.

Centralization of controls expanding in scope.

More use of the turbine-pump type of hydraulic machine.

Cooling water supply will depend increasingly on cooling towers.

references to 1954 issues of Electrical World

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2. 11/15 p 114
3. 11/29 p 66
4. 4/12 p 48, 50, 52
5. 10/18 p 127
6. 10/18 p 127
7. 5/24 p 29
8. 6/14 p 113
9. 4/12 p 42
10. 4/12 p 25
11. 9/6 p 91
12. 4/12 p 8
13. 3/15 p 6
14. 10/11 p 8
15. 1/25 p 139
16. 1/8 p 6
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19. 3/15 p 7
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21. 8/30 p 15
22. 12/20 p 5
23. 9/13 p 55
24. 9/6 p 63
25. 8/23 p 90
26. 10/11 p 32
27. 10/11 p 26
28. 6/21 p 5
29. 7/19 p 47
30. 6/21 p 42
31. 11/1 p 69
32. 7/5 p 16
3/29 p 42
33. 5/31 p 71
34. 2/22 p 108

TRANSMISSION

daniel t. braymer

managing editor

ehv frontiers breached in 1954

In the field of transmission, 1954 has been an unusually active year. It saw the first sustained operation of a line at 330 kv on the American Gas & Electric and OVEC systems. It also saw construction started for a 300-kv line by Quebec Hydro-Electric Power Commission and advancement of extra-high voltage construction by Bonneville Power Administration and British Columbia Electric.

Radio Interference a Hurdle . . . In the area of EHV 1954 began and ended on a note of uncertainty under the threat of radio-interference. In January American Gas & Electric Co engineers reported[1] that initial operation of a 330-kv circuit at rated voltage brought RI factors higher than expected. Cleaning up conductors and splices was undertaken, and conductor diameter increased from 1.6 to 1.75 in. on some related lines to control RI.

Bonneville, committed to using 345 kv, to expand its transmission capacity,[2] this year put its 345 kv rotated-base, single- and double-circuit tower designs successfully through full-scale tests[3] and got construction underway,[4] but halted it promptly[5] when the trouble with flared strands showed up. After improvement in stringing techniques work resumed[6] experimentally and finally went ahead cautiously.[7]

In May this year Quebec Hydro-Electric Power Commission began the first leg of its 275-mile 300-kv Bersimous line due for completion in 1956.

At the lower voltages, 230 kv made its debut in the Southeast when Duke Power completed 77-miles of double-circuit tower line.[8] In Pennsylvania a 220-kv backbone circuit was energized linking Metropolitan Edison and Pennsylvania Electric Co systems and tying them with the Pennsylvania Power & Light Co system at Hosensack sub.[9]

Use of double conductors, which has already won its spurs in Europe,[10] at 230 kv and up, began this year to find its way into U.S. practice at lower voltages. Carolina Power & Light Co used it on a 40-mile, 110-kv line.[11]

Experimenting on a 3-mile section of 110-kv line, Louisiana Power & Light Co[12] found the labor cost of adding a second conductor was almost exactly $1,000 per mile.

This year Okonite[13] and Phelps-Dodge[14] shipped their first milages of 230-kv high-pressure oil-filled pipe-type cable to be made in this country. One shipment went to Cubatao power plant of Sao Paulo Light & Power Co[15] the other to Garrison Dam.

Highest voltage cables to be installed in North America to date were installed at the Kemano-Kitamat project[16] in western British Columbia where two circuits of three 301-kv oil-filled, single-conductor cable having a nominal capacity of 240 Mva were installed. One circuit is of conventional construction; the other has both aluminum conductor and sheath.

General Cable Corp was the first U.S. cable maker so far to announce plans for production of aluminum sheath cable[17] by the direct extrusion methods.

Interconnection across national boundaries figured in the transmission news here[18] and abroad. Early 1954 saw the world's largest international power exchange established and operating between Detroit Edison Co and the Hydro-Electric Power Commission of Ontario.[19]

the 1955 outlook in transmission

New conductor designs will be introduced to minimize the threat of RI at EHV.

Committment of new lines at 330/345 kw will await solution of mechanical construction difficulties on early lines.

At least one new pipe-cable installation for operation at 169 or 230 kv will be announced.

First extruded aluminum sheath power cable to be made in the U.S. will be produced in 1955.

The year will see accelerated use of bundled conductors on lines of 115 kv and below.

At least one mayor backbone transmission line ranging in length up to 400 miles will be announced next year.

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1. 2/8 p 69
2. 10/18 p 117
3. 2/8 p 82
4. 9/20 p 110
5. 9/13 p 30
6. 10/14 p 62
7. 11/22 p 27
8. 9/6 p 85
9. 7/26 p 84
10. 1/4 p 47
11. 7/12 p 106
12. 10/4 p 68
13. 6/28 p 137
14. 8/2 p 59
15. 11/29 p 76
16. 11/1 p 77
17. 7/19 p 59
18. 1/4 p 9
19. 2/15 p 42
20. 4/26 p 48

leonard m. olmsted associate editor

distribution gained stature in 1954

Accelerated activity made 1954 a great year in distribution. Developments include:

1. Widespread revision of system plans to provide for the sharp increase in load growth.

2. Sweeping acceptance of shunt capacitors for improving distribution power factor and voltage.

3. Mounting recognition of the need to evaluate service interruptions and to establish methods for building reliability into tomorrow's circuits.

4. Extensive analysis of system destruction and plans for averting catastrophe.

5. Continuing awareness of economic pressure.

Rapid Growth Sets Pattern . . . Predictions made early in 1954 showed residential use of electricity climbing to 229 billion kwhr in 1963 for $5.6-billion revenue, compared with 97 billion kwhr and $2.65 billion for 1953. Residential use will climb to 36% of total energy sales, with 240-v appliances soaring 136% while other devices gain but 78%.[3] Low load factor and service for 3 to 5-hp motors were cited as problems to solve. Higher primary voltage was recommended for economy, reliability, and appearance, and 2/0 A1 for secondaries at either 120/240 or 240/480 v.[3]

Sustained rapid growth has occurred for several years on a number of power systems, particularly in West South Central and Pacific areas. Houston L&P serves distribution growth at 12 kv from outdoor automatic substations, correcting power factor with primary capacitors at the rate of 0.5 kvar per kw of added load.[3] Southwestern PS plans to serve double load by 1958, using 12-kv primaries and capacitors.[4] And Pacific G&E found that 12 kv saves $10 to $20 per kva in new suburban areas, mostly in substations and subtransmission. But converting from 4 kv costs $30 to $100 per kva needs careful study.[5]

Survey Discloses Trends . . . Electrical World surveyed the practices and predictions of 90 utilities and 17 co-ops. Replies disclosed that over 40% already use 12 or 13 kv for fast-growing residential and rural areas and nearly 60% expect to in the future. Only two report 24-kv in use but several others contemplate its use in the future. Al and ACSR continue their spectacular sweep into the distribution system. Substation banks mount in capacity. And voltage regulation depends increasingly on switched capacitors and substation bank tap changers.[6]

Editorial comment held that systems doubling in capacity every ten years rapidly assume the form of current design practice.[7] But growth must guide changing to a higher primary voltage because conversion cost could dissipate expected savings.[8] Study is the pressing need, for expenditures exceeding $1-billion annually are building tomorrow's distribution.[9] Obsolescence of existing plant must be weighed in the long-range plan.[10]

Secondaries are banked for 120/240 and 120/208 v in Portsmouth, Va., to save 30% in transformer capacity and 32% in secondary copper.[11] Inexpensive light-duty breakers replace tie fuses to give banks automatic features in San Antonio.[12] And internal-breaker transformers feed the banks of Lakewood, Calif.[13] Banking secondaries is anticipated by over half the utilities in the survey.

Larger motor-driven appliances, notably central air conditioners, are driving some utilities to 3-ph secondaries. Many companies in the South provide this by adding a fourth wire and a transformer connected open-delta to existing 120/240 v mains.[14] Some turn to 120/208 as less costly than separate light and power.[15] But several lean toward 240/416 or 240/480 v for distribution economy.[16] The latter, warned one expert, is "not in the cards" because customers spending $7-billion a year for appliances cannot be expected to pay extra for a new service voltage."[17]

Secondary Capacitors Prove Valuable . . . Newest use of secondary capacitors is in series with the primary neutral of 2,400 v distribution transformers to boost voltage for the kvar loading of room air conditioners. Oklahoma PS finds that one 3-kvar capacitor boosts voltage about 5% on 15 and 25-kva transformers, uses a 5-kvar unit for 37½ kva.[18]

Conventional connection of secondary capacitors relieves overloaded transformers and corrects low service voltage.[19] Programmed installation, such as two 3-kvar units on each 15-kva transformer below 0.9 pf, must be justified by loss reduction in primary laterals, transformers, and secondaries.[20] But such use can show returns up to 30% where motor loads are a problem.[21]

A wise balance between secondary and primary capacitors gives the best economies.[19] But their use in combination with voltage regulators gives the cheapest control of voltage with added load capability.[20] Primary capacitors can be switched with time delay by thermal meters sensing volts, watts, vars, or amps.[22] But long off periods at low

ambients are destructive unless time is broken by cycling or low-temperature askarel is used.[24]

Fuses selected from the EEI-NEMA "T" series to melt at twice capacitor rating prevent tank rupture[25] which can develop explosive violence, particularly in secondary capacitors.[26] Primary capacitor neutrals should be tied to circuit neutral to prevent abnormal 3-ph voltages when one phase opens.[28] And capacitors across the open leg of open-delta secondaries can produce 600 v on services if one primary fuse blows.[27]

Engineers Restudy Transformers . . . Drastic change in loading practices since distribution transformer characteristics were last set up is instigating questions about the suitability of their losses and regulation.[28] Use of taps, nearly extinct on 2,400 v units, remains the practice at 7,200 v. But omitting them cuts price 5%, saves 10% in losses, and improves reactive characteristics.[29]

Shop assembly of transformer and accessories was recommended to save installation time.[30] And preassembled units cut vault space and cost.[31] Selection of transformers made according to the EEI-NEMA 5th Report has been simplified by charts prepared by the joint committee.[32]

Continuous improvement in methods for evaluating ambient temperature, load cycles, higher emergency temperatures, portable fans, and load transfer has saved one utility $11 million in substation investment.[33] Another added external water coolers to boost capability of a 10,000-kva water-cooled transformer to 125%.[34]

Landscaping of substations has become practice for Long Island Lighting at costs averaging 1.9%.[35] And noise is most economically reduced by using barriers to cut standard transformers by 10 db.[36] A new approach to site procurement is plan of Nashville Electric Service to work through planning commission.[37] And supervisory control has been advocated as costing less than operators' wages.[38]

Desire for reliable service to its 8-block business district led Wapakoneta, Ohio, to install an overhead secondary network. Units comprise banks of 50-kva transformers and light-duty protectors on alley poles.[39] Somewhat heavier densities can have conventional network units in vaults and use both underground and aerial cable to serve the customers.[40] Vault transformers can be cooled 10C by fans to assist natural ventilation.[41]

Building loads in heavy-density areas are out-growing 120/208 v network economy. Movement is to 277/480 to save $25 to $30 per kva of building load.[42] Survey of parameters indicates this new voltage may save wherever directly connectable load exceeds 33 to 50% or feeders exceed 200 ft.[43] Comparisons indicate that the new voltage could save 10% in conventional low-voltage networks.[44]

Utilities Strive for Reliability . . . EW's survey revealed ten utilities already designing their distribution to meet standardized limits of service interruption and nine others considering future standardization. One pioneer reported that reliability standards cut confusion and aid economy.[45]

Analysis of distribution faults for 11,700 circuit-mile years by an AIEE-EEI joint committee disclosed that 46% of trouble comes from trees and wind, 19% from lightning, and only 11% from equipment and wire failures. Damage to covered conductors smaller than No. 4 can be prevented only by shorting devices or small reclosers and fuses.[46] One utility member branded this report "only a small start," urged utilities to establish a measure for performance.[47]

Service to 4-million families in eastern states suffered disruption from three hurricanes.[48] In their wake came the usual urging for underground distribution, this time in Massachusetts where utility spokesmen estimated their cost at $1 billion to $2 billion augmented by customer expenditures of $30 to $150 each.[49] But Connecticut's PUC dusted off its 10-Point Plan, decided it "worked very well."

Utilities continued to streamline handling of trouble. Commonwealth Edison coordinated records with postal zones and speeded paper work.[50] Florida P&L set up training program, estimated cost repaid by use one year in 10.[51]

in the Year Ahead . . .

More primary distribution at 12 and 13 kv.

Conversion of 4-kv fringes to higher voltages.

Larger banks in distribution substations supplied at 69 kv or higher.

Greater use of aluminum and ACSR conductors.

Increasing acceptance of aerial cable lightened by aluminum sheaths.

More switched primary capacitors to correct low power factor and voltage.

Emphasis on 25-kva and larger distribution transformers for growth.

More secondary capacitors to cut transformer overloads and raise voltage.

Intensified effort to improve reliability and streamline restoration.

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18. 11/29 p 86
19. 12/13 p 247
20. 10/4 p 82
21. 4/19 p 110
22. 5/24 p 41
23. 3/8 p 103
24. 3/15 p 47
25. 7/12 p 103
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27. 5/31 p 41
28. 1/25 p 132
29. 5/10 p 24
30. 10/25 p 50
31. 2/22 p 119
32. 7/12 p 122; 7/26 p 116; 8/9 p 116
33. 8/9 p 90
34. 2/8 p 102
35. 9/6 p 73
36. 4/12 p 52
37. 11/29 p 70
38. 1/11 p 96; 5/24 p 41
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40. 9/16 p 76
41. 6/14 p 117
42. 3/8 p 80
43. 11/29 p 84
44. 11/8 p 28
45. 5/17 p 150
46. 11/8 p 28
47. 2/22 p 95
48. 9/13 p 9; 9/20 p 106; 10/25 p 8
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50. 4/19 p 114
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MANUFACTURING

rue m. shoop associate editor

plants and products improved

Highlighting manufacturers' activities in 1954 were the completion of research facilities, design of nuclear reactors, production of high-voltage breakers, switches, cables and insulators, also new designs of meters.

Research laboratories for the study of transformer noise were opened.[1] Other test centers[2] were erected to provide facilities for studying insulator qualities, determining mechanical and electrical properties of conductors and materials, measuring magnetic fields, analyzing magnetic materials, developing steam turbines, and hydrotesting large pumps.

Atomic reactor designs[3] were offered for research, development, and personnel training in the "water-boiler" and "swimming pool" types, and a "packaged" power plant.

330-Kv Equipment Made . . . This year many larger items were manufactured. Among the 330-kv items[4] for the Ohio Valley Electric Corp project were 3-pole disconnect switches, 25-million-kva circuit breakers, air break switches, and a 150,000-kva, 330/138-kv autotransformer.

Other large apparatus[5] made available were a 315,000-kva (top-rated) transformer; 2,000-kva, 69-kv gas-insulated transformers; 10-million-kva, 230-kv circuit breaker; 350 to 1,000-kw mobile, diesel generators; a flat-car-mounted, 50,000-kva, 3-ph transformer; and three 5,000-kva, 110-kv-2.4/4.1-kv mobile substations.

Cable design and manufacturing processes showed great progress throughout the year. First two 230-kv cables were shipped. Both were 500 Mcm, high-pressure, pipe-type. One of 22,280 ft went to Brazil, the other of 9,600 ft to Garrison Dam.[6] An aluminum-sheathed, 132-kv oil-filled cable was ordered by the British Electricity Authority.[7]

An Alsheath press for continuous extrusion of aluminum sheathing[8] was developed jointly by British Insulated Callender's Cables, Ltd, and the Loewy Engineering Co. Another cable sheath, tellurium-lead, having stabilized bending and creep resistant properties is being produced.

Several designs of insulators are to be noted.[9] A suspension type is produced with the glaze thickness held to an optimum value where resistance to mechanical impact is greatest. Large homogeneous high-voltage porcelain bushing-type insulators[10] (112 in. long, 24-in. OD) are in production for circuit breakers. Another large insulator (101 in. long) is made for a 230-kv pothead. Pin-type and suspension-type insulators have special designs for use in fog atmospheres.

An electronic load and frequency control system[11] is now available for plant and tie-lines.

Single-phase watt-hour meters[12] for residential service have been developed for 15 and 30-amp ratings and overloads of 100 and 200 amp.

predictions for 1955

Manufacturers acquisitions and mergers will probably continue at about the same rate.

New plants and plant additions will continue moderately including production facilities for power bushings, capacitors, insulators, and protective equipment.

Nuclear reactors are expected to be offered by more manufacturers.

Continuous extrusion of aluminum sheath for cables will have further developments in this country.

Aluminum conductor output will increase.

New and improved insulation for wire and cable will be announced.

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ary mossiman manager of market research

PA's began to 'shop' in 1954

Purchasing agents found 1954 a buyers' year. The elimination of government controls, felt only slightly in 1953, and the more readily available supply of materials and equipment brought with them the first real opportunity in years for purchasing agents to "shop the market."

Improved deliveries during the year made it possible for most purchasing agents and store managers to consider cutting costs by reducing inventories.[1] To cut inventories several companies have centralized their warehousing operations.[2] At other companies vendors were requested to maintain utility stocks in their own inventories. In at least one instance this technique has received the enthusiastic cooperation of distributors, reportedly improving their turnover.[3]

Vendors Maintain Inventories . . . A slightly different plan involving a forecast of requirements is being tried by other utilities.[4] In these cases the utility provides the vendor with an estimate of its probable requirements for the next two or three quarters. This permits a vendor to maintain an inventory consistent with probable orders.

The continued high level of utility construction made it necessary for most utilities to examine their materials handling operations.[5] Entirely new concepts of packaging, handling, storing, and disbursing of materials were developed. Vendors also profited by utility efforts to reduce the number of sizes of containers to a minimum as they found they were saving time and labor in packing and loading for shipment.

Utilities were not alone in their efforts to reduce handling costs with several manufacturers announcing redesigns of crates and containers.[6]

Of great concern to manufacturers of heavy equipment, especially turbine-generators and boilers, was the lull during the early part of the year in utility orders in the face of an estimated continued need for new capacity additions.[7] Utilities were warned against delaying orders too long.[8] It was feared that the length of time required to get a unit into operation after it has been approved would make it impossible to get a place on manufacturers' schedules for delivery at the time units will be really needed. Manufacturing capacity might be wasted and valuable personnel lost if unbalanced purchasing were allowed to continue. Balanced ordering, manufacturers repeatedly pointed out, would prevent overtaxing manufacturing production during 1957 and 1958.

In order to stimulate orderly purchase of turbine-generators manufacturers announced new policies easing the financing process.[9]

ups and downs ahead in 1955

Utility purchases of materials and equipment are expected to decline during 1955 along with the decrease in construction budgets. But the anticipated decrease will be due to smaller outlays for generating facilities in advance of a lower level of capacity additions during 1956 and 1957.

Expenditures for distribution materials and equipment are expected to increase substantially.

Inventories and inventory control will probably be the subject of a great deal of attention on the part of both utilities and vendors. Much of the effort will be directed toward attaining a balance of inventories which, in addition to being equitable, will provide ample stocks.

Other possible developments are:

A higher level of orders for turbine-generators, and other heavy equipment in advance of a higher level of capacity additions by 1958.

A continuation of the interest in packaging and warehousing.

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richard everett economist

recession was a short one

The year 1954—begun in an economic recession—is ending in a revival that may even grow into a boom. The recession was brought on, as expected,[1] partly by the fact that business over-bought inventory. It was compounded by cuts in defense spending and by the government's short-lived "hard money" policy.

The recession started in the late summer of 1953 and lasted, roughly, through this September. It hit especially hard at some major power consuming industries, such as steel.[2] As a result, year-to-year industrial gains in electric power consumption ran below the normal experience through most of the year. But, by the end of 1954, weekly power figures were again showing healthy gains over the year-earlier levels.

People Spent at Record Rate . . . The American consumer provided a bright note throughout the recession. Consumers continued to spend money at record or near-record rates, as expected. Consumer spending not only helped stave off a more serious recession, it also meant another solid gain for residential power consumption.[3]

Stable costs of expanding utility plants also were welcome developments during the year. Expansion costs —buildings and equipment prices— were expected to level off in 1954,[4] and they did.[5] Another key cost—the cost of borrowing money—also leveled off as anticipated. Utility bond yields dropped slightly in the first two months of the year, then held pretty stable through the rest of the year.[6] The end of the inflation that hit first buildings and equipment in 1950-1952 and then money costs in 1953 was a welcome development for utilities.

Air conditioning, one of the key growth factors in power consumption, had a good year. But sales of room coolers failed to match some of the more optimistic expectations even though they did gain substantially. The reason: cooler summer, plus some of the natural mistakes that accompany any new and growing product.[7] The result was heavy overproduction of room coolers and huge unsold supplies left over at yearend. Consequently, output may actually decline in 1955, even though sales are expected to show another solid increase.

Homebuilding went through a recession of its own, although a mild one, late in 1953. But by early this year housing starts were improving. And the passage of the new housing act by Congress last summer started what is beginning to look like another superboom period in the long housing boom.[8] As an illustration, contracts for new residential buildings (F. W. Dodge) were 28% higher for the first 11 months of 1954 than in the same period of 1953.

The year ended on widespread signs that business was enjoying a substantial revival, with some prospects of a boom next year.

first half of 1955 looks good

Next Year is expected to get a fast start, economically speaking. Business and consumer confidence — vital factors in short-run economic developments — is strong. Bloated business inventories, which helped cause the recent recession, have been cut back.

Two key industries, automobiles and housing, are riding the crest of new sales assets — new models in the case of autos and easy-easy-easy credit in the case of housing. The outlook for the first half of 1955 is for rising business and good gains in power sales.

Business in the second half is also expected to be good, but it may be plagued by labor troubles and a reaction to possible over-confidence in the first half of the year.

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fischer black editor

industry growth still big problem

Heavy load growth in some areas along with reduced load growth in others presented utility management with many new problems in 1954. Then a series of sleet storms, heat storms, hurricanes, and floods accelerated the need for more planning in the field of service continuity. And the trend toward the use of more scientific management selection and training techniques continued.

Utility capacity reserve margins reached adequate levels in 1954 of around 19%.[1] This development along with the reduction in lead time required for placement of large machinery orders reduced commitments to a low level throughout most of the year.[2] This situation caused much concern among manufacturers and was similarly treated in Walker Cisler's review of industry growth trends before the annual meeting of Edison Electric Institute.[4]

The sharp increase in air conditioning loads along with the continuing rapid gain in residential and commercial use brought new emphasis on distribution system planning.[4] Trends in distribution were shown by Electrical World's survey.[5]

Service Restoration Gets Attention . . . Overall importance of efficient and dependable service was well summarized by Ohio Edison's president Walter H. Sammis.[6] Such a gage of the needs of the industry came none too soon as storms and heat waves plagued utilities throughout the year. Plans for handling storms received much attention.[7]

Rapid growth of customer loads also brought renewed interest in the inadequate wiring problem. It stimulated pay-as-you-go home wiring plans sponsored by a number of electric companies, Cincinnati Gas & Electric Co leading the way.[8] Pennsylvania Power & Light Co announced it would finance residential electric range and water heater installation costs through a new "Wire on Time" plan.[9] An extensive survey of home wiring was sponsored by Consolidated Edison Co as a part of its adequate wiring program.[10]

The year will also go down in history as the turning point in the trend toward electric house heating. American Gas & Electric Co,[11] Union Electric Co,[12] and Pacific Gas & Electric Co[13] all announced plans for promotion.

Selection and training of present and future executives was a pressing problem as other industries competed vigorously with utilities for trained personnel.[14] Utilities had a tough job attracting enough electrical engineers to meet their needs.[15] Executives were advised to pay closer attention to the professional development of young engineers.[16]

Several novel programs designed to improve communications within companies and to improve management techniques were tried out. The Southern Co called on the younger executives of its operating companies to discuss new developments and system operations at a meeting for the directors and principal officers of the parent company and subsidiaries. Conceived by Board Chairman E. A. Yates, the two-day meeting enabled the principal officers to view the younger executives in action.[17] In Georgia rural electric cooperative managers gathered at the state university in August for a three-day executive development course set up by the school's College of Business Administration.[18]

new problems in 1955

Load growth in peak and output will be above estimates.

Summer peaks will gain on winter.

The need for higher capital additions and new system design will be called for.

Long range system planning will be emphasized.

Managerial talent and technical manpower will be in greater demand.

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FEDERAL POWER POLICY

jesse mock assistant to the editor

republicans put dam policy into action

With President Eisenhower occasionally taking a direct hand,[1] the first Republican Administration in 20 years continued translating its power policies into action. The Republican-controlled Congress, following White House leadership, chalked up an impressive record of writing these policies on the nation's law books.[2]

A modernized atomic energy law, opening the door to industry participation in the development of nuclear power,[3] stands as the monumental achievement of the second session of the 83rd Congress. Weary senators weathered a 13-day talkathon which gained nationwide attention to clear the bill for passage.[4] Administration proposals had called for revision rather than a complete rewrite of nuclear legislation.[5] While electric company executives generally endorsed the proposed changes,[6] public power groups vigorously opposed any basic revision.[7] These groups eventually succeeded in getting two "preference clauses" written into the new law.[8]

Dixon-Yates Issue . . . Much of the debate on atomic legislation centered on a side issue—a power supply contract which President Eisenhower had ordered the Atomic Energy Commission to negotiate with Middle South Utilities, Inc, headed by Edgar H. Dixon and the Southern Co headed by E. A. Yates.[9] Democrats seized on the Dixon-Yates contract as a major issue for hacking away at GOP policies. They carried it into the congressional election campaigns[10] with little discernible success.[11] (Also see page 73).

Administration policy placing more reliance on local interests and local-federal partnership arrangements to develop hydroelectric potential received congressional endorsement. One measure approved permits Alabama Power Co to apply for licenses to build a $100 million, 5-dam development on the Coosa River.[12] Others cleared the way for local or partnership development of the Priest Rapids site on the Columbia River and the Markham Ferry site on the Grand River in Oklahoma.[13] Electric companies and local groups responded to this policy by filing numerous applications for Federal Power Commission licenses to develop power sites.[14]

Request for funds to aid the local-federal projects first appeared in the President's budget submitted to Congress in January.[15] For other federal power items, however, the budget requests were the lowest in recent years. The House upheld most of the cuts recommended and did some further snipping of its own in the budget.[16]

The Water Resources and Power task force of the new Hoover Commission at year end was putting the final touches on preliminary recommendations for improving federal power policies and the machinery for carrying them out. From a series of five regional hearings and from countless closed sessions, task force members and staff have been gathering background material for the preliminary report due at the end of this month.[17]

Power issues figured in the election of congressmen from seven states in the November vote,[18] but attention focused mainly on the Oregon senatorial election where GOP power proponent, Guy Cordon, lost to New Dealer Richard Neuberger by a narrow margin.[19]

the year ahead in washington

Congress may approve changes in the new Atomic Energy Act.

Look for the Democrats to investigate the electric utility industry.

Taking preliminary Hoover Commission recommendations as a basis, Administration may urge changes in power marketing laws.

Federal budget will include some new starts on power projects.

License will be granted for Idaho Power Co's Hells Canyon project.

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    4/12 p 6
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18. 10/25 p 17
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COMMERCIAL

e. bryson sessions assistant editor

selling helps make 1954 a good year

Said one power company president at the beginning of this year: "Everybody in our company has got to be selling. Everybody with whom we've affiliated has got to be selling."[1]

This dutiful, roll-up-your-sleeves approach pretty much prevailed throughout the industry's loadbuilding handiwork this year. And with this buckling down came a growing tendency to look to one another for help. This was strongly demonstrated in the way diverse organizations were getting together on projects. A couple of notable examples: the Conference Group on Coordination of Electric Industry Sales and Promotion Programs,[2] and the Inter-Industry Farm Electric Utilization Council.[3]

There was good reason for this spirit of industrial comraderie. With softer markets as the year opened plus more electric power on hand, the job of selling and selling hard required all the willing hands that could be mustered.

Within this selling job, two problems stood out, the summer load peak and adequate wiring. Bound up in these two problems were a multitude of others that taxed the talents of utility sales staffs.

Many companies this year found themselves with a phenomenon on their hands that only a few years earlier would have sounded like a wild dream. People were starting to use more energy in the summer than they were in the cold, dark days of winter.[4] Air conditioning, of course (plus irrigation pumping in some areas), was the biggest reason. The air conditioning boom which got moving in 1953 carried on, as was expected, in 1954. By 1963 its connected load may be well in excess of 55 million kw and annual energy requirement 55 billion kwhr or more.

Electric Heating . . . As the summer load curve shot up, so did the problem of what to do to offset it in winter. The obvious solution seemed to be electric space heating. If nothing else, air conditioning has speeded utility interest in promoting electricity for heating homes.

The heat pump looms as the logical and final answer, but its initial cost keeps it for the time being out of the mass market. Residential resistance heating bids fair in the interim.

The industry, however, still is in great need of additional authoritative house heating data plus some intelligent guidance and control, if it is to develop properly. One large midwest utility has found the heating load, with an early morning peak, helps to flatten its residential curve, and several other companies either have completed studies or have them underway.

No doubt about it, public interest in electric house heating is increasing. But too many utility managements still tend to overlook it. Wrote one Electrical World reader: "Utilities seem to look on house heating as a problem. As exponents of enterprise they should see it as an opportunity for growth of their business."

Utility experience with the heat pump was disclosed in a special Electrical World report during the fall. The market is opening up, the heat pump is moving north. But it is going to require all-out utility interest and promotion if it is to rise from the 4,300 installations of today to the predicted one million ten years from now.

The "Bottleneck" . . . In adequate wiring,[5] air conditioning also had its effect. For years past a few lonesome segments of the industry had foreseen this problem. But it wasn't until this year when multitudes of air conditioner buyers either had to rewire or return their purchases, that the general public began to understand. And with some 40 million American homes affected, manufacturers, dealers, and power suppliers alike could see inadequate wiring as the greatest "bottleneck" to future electrical growth. A wave of speeches, trade and consumer ads, booklets, etc. followed. Electrical World, itself, initiated a series of wiring advertisements in prominent trade publications.

There were some definite gains made, too. This was the year of the Cincinnati plan, a new concept in promotion which allows the consumer to pay for his rewiring job on time. Other utilities and electric leagues were quick to see its possibilities and at year's end an ever-growing list of them were adopting some sort of wire-on-time program.

It was the year, too, in which the residential service entrance standard was raised to a 100-amp minimum. The National Association of Home Builders adopted a 100-amp voluntary standard last spring, and Edison Electric Institute followed with its revised residential wiring handbook. Additional funds were granted to the National Adequate Wiring Bureau. All this represented a good start, but one major hurdle still remained: that of getting the appraisal fraternity to include better than bare minimum wiring as part of a home's valuation. This must come before full adequate wiring can be realized, and the industry is at work on it now.

Farm Market . . . While loadbuilding in the urban markets brought a potpourri of complexities and activities, there was another which seemed almost static by comparison. This was the American farm, a market virtually untapped electrically. In a 36-page feature (Dec. 13) Electrical World showed how use of electricity in farm production is lagging behind. Only about 700 kwhr per farmer per year goes into farm production jobs.[6] It showed how those all-too-few farm customers, who really have put electricity to work, swear by it. They're making more money, getting better production, and doing it with less work.

That the year brought an increasing awareness of this need to sell the farmer was shown by the formation of the Inter-Industry Farm Electric Utilization Council. It wants to step up rural power use through various segments of the industry (manufacturers, power companies, co-ops, distributors, dealers, educational groups) operating through statewide organizations. So far, the council and its state affiliates have made a good start. Enthusiasm is high, and the coming months should give more visible proof of what they can do.

Lighting . . . In the field of lighting there was more conscious and organized effort to get things done.[7] The National Lighting Bureau got going in its project to accelerate commercial and industrial lighting. EEI turned its attention to the rural side with its farm lighting promotion. And over the country more and more utilities became conscious of the need to sell good illumination. They did this through a variety of promotional vehicles: through participation in the Beauty Plus lamp program, with bags of bulbs promotions, lighting demonstration rooms, and the like.

Fluorescent street lighting also showed some gains, but within the whole realm of street lighting there still remained great new sales opportunities. Illumination on the streets of this nation are right now estimated to be only 7% adequate.

Appliances . . . A splashy use of color and greater versatility marked the new appliances.[8] Such things as multi-appliance and built-in kitchen units, ovens with throw-away linings, and fruit juice dispensers in refrigerators found their way to show rooms to vie in the fierce battle for consumer selection. Even the dishwasher was given more attention both in its engineering and sales promotion as new efforts were made to wake up this so-called "sleeping beauty." Color television, in spite of last year's optimism, still had yet to get off the ground.

To utilities, however, the two most significant appliance developments were (1) the manufacturers' agreement to build air conditioners with higher power factors by 1956 (one already has done so)[9] (2) the introduction of the smaller capacity, higher wattage, quick recovery water heater.[10]

Overall appliance sales in most cases were down some in 1954 but still good. In some regions where the sales efforts were well-planned and intensive, volume was well above last year's mark. The Light's Diamond Jubilee theme was put to effective promotional use by many companies to buoy what otherwise might have been a sinking sales record. The value of hard selling was demonstrated over and over again by the numerous utilities who registered gains with "campaign" items (those which were given special promotion) and levels or decreases on those which were bypassed.

a good year ahead despite some problems

Total home appliances sales will reach 75 million of which about 12 million will be new in new homes, 50 million new in existing homes, and 13 million in replacements.

Inadequate wiring will continue to be the major ''bottleneck'' to appliance sales and load growth, but new unified efforts by the industry will make gains in smashing it.

Air conditioning will be a bigger problem than ever to utilities. Near boom sales will continue; and manufacturers, if they don't overproduce again, will have a chance to unload some of last year's carry-over inventory.

More utilities will register summer peaks and with it will come more interest in heat pumps and electric space heating. More factual experience data will be forthcoming.

Standardized, quick recovery water heating could make some definite headway.

More attention will be given to selling the farmer.

New emphasis will be put on improved lighting in the farm, residential and commercial fields.

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2. 1/4 p 8
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3. 8/23 p 96
4. 1/11 p 145
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   3/8 p 71
   3/22 p 95
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   12/6 p 15
   12/13 p 103
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   5/17 p 118
   8/23 p 193
   9/13 p 48
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   10/4 p 114
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   11/29 p 130
10. 4/26 p 27

allen long assistant editor

bus-duct systems win favor in past year

The trend toward 480Y/277-v bus-duct systems for distributing large blocks of power to commercial buildings gathered momentum in 1954 as economic statistics began trickling in from scattered industrial studies.

Two cases showed the higher-voltage system would yield savings over 208/120-v systems for the same proposed load. Savings ran as high as $32 per kva of load. A large auto manufacturer chose this system to provide flexibility of electrical distribution of 11,000 kva in an assembly plant, one building of which covers 30 acres.

A utility predicts saving $13,000 per generating unit by using plug-in bus duct for 480-v power. It will replace conventional switchgear and motor-control-center type of control and distribution. The utility anticipates these advantages: Lower first cost, floor space savings, reduced future maintenance and shutdown time, increased safety, and ease of making changes and adding equipment. Parameters also were spelled out to guide engineers who must decide whether to use this system.[1]

Industrial Heating Gains . . . More industrialists became enthusiastic upon discovering the promise held by infrared heating. Infrared devices were harnessed to such diversified tasks as reconditioning oil drums,[2] reducing saw blade rejects,[3] and hastening the setting of concrete in steel molds.[4] Electric heat also sped hosiery production,[5] kept hangar doors operative,[6] and melted discarded type to increase employee comfort in a printing plant.[7]

The Industrial Electrification Council held its first electric heating conference in Cincinnati to stimulate applications of electricity to heat problems. A feeling in the steel industry that electric furnaces produce inferior large castings was debunked. W. B. Wallis, president, Pittsburgh Electromelt Furnace Corp, cited a Canadian steel company that has been producing better castings from two 75-ton electric furnaces than from its open hearths.[8]

The IEC Electric Heating School revealed a course aimed at helping utilities educate industrial design engineers, plant engineers, and electricians. It teaches them to make simpler installations without outside help.[9] Complete with leader's guides, slides, and 50 students' texts, the kit is now available. Eighteen utilities already have bought the course. Two had given it to their own salesmen and customers at the year's end. One of these plans to repeat it "several times."

National Lighting Bureau, set up by NEMA's Industrial and Commercial Lighting Equipment Section, began its attack upon inadequate lighting in commercial and industrial establishments. More than a third of such lighting is below standards at the time of World War I.[9]

Better industrial lighting may be stimulated by a 110-w, 8-ft fluorescent lamp said to produce 35% more light than any previous fluorescent source.[10] A floral company reported a better off-season business after lighting 12 acres of flowerbeds to make chrysanthemums come in late and Shasta daisies early.[11] A fruit company relit its accounting office with fluorescents to a 100 ft-c level—subsequently observed increased employee efficiency and thriving morale.[12] Mixing mercury-vapor and incandescent lamps to eliminate the "strobe" hazard of rotating machinery raised production, cut accidents, and boosted morale in an iron works.[13]

just around the corner

A growing market in the form of electric furnaces for sintering powdered metal products.

More than 55 million kw of connected air conditioning load by 1963. Power consumption will top 55 billion kwhr or more.

Continued expansion of electric heating tailored to specific production tasks.

More heat pumps in industrial buildings.

references to 1954 issues of Electrical World

1. 5/24 p 29; 10/18 p 121; 11/29 p 85; 11/22 p 30
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4. 10/4 p 110
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herbert r. frankel associate editor

decline in money rates was news

The decline in money rates was the outstanding event in the financial field in 1954. It was a big factor in establishing a record in public security offerings in the electric industry. This decline followed a rapid rise during the second quarter of 1953 and has been as sharp and widespread as in the comparable phase of any business downturn since World War I.[1]

Yields Went Down . . . First quality bond yields hit 3.34% at the end of the second quarter of 1953.[2] By Dec. 2, 1954, they stood at 2.88%.[3] Yields on other securities were down also.

Many companies that had sold securities in 1953 refunded them in 1954 at lower interest rates. Thus the industry recorded another high in 1954 by selling publicly an estimated $2.1 billion ($1.57 billion "new money" and $540 million "refunding") in securities as compared with $1.7 billion ($1.67 billion "new money" and the balance was for "refunding") in 1953.[4]

Recent common stock offerings have held down earnings per share. Although income available for common for the eight months ended August was up 8% over the like 1953 period, a Reis & Chandler, Inc, compilation showed an increase of only 2½% on an earnings per share basis for the 12 months ended Sept. 30, as compared with the same period of 1953.[5]

A number of mergers and consolidations were effected during 1954. Principal ones were Pacific Gas & Electric Co and Pacific Public Service Co,[6] and Pacific Power & Light Co and Mountain States Power Co.[7]

The ruling of the Maine Supreme Court in the case of the Central Maine Power Co has overshadowed all other decisions in the field of utility regulation.[8] The court in upholding the fair value law of the state remanded the company's case to the Maine Public Service Commission for a rehearing. The court said it did not believe that an increase over original cost depreciated of barely 3% is an appreciable reflection of the impact of inflation values.

The right of management to run its properties was upheld by the Georgia Supreme Court on a petition by the Georgia Power Co.[9] In this instance the court ruled that Georgia PSC's order to the company to sell to the Georgia Power & Light Co substantially all of its power requirements at rates equal to those under which the GPC charged to co-ops and municipals was an invasion of the rights of management and consequently was officially declared unconstitutional.

In addition, the court ruled that the PSC order to GP&L to merge with GPC, or if it was unwilling or unable to do so to have its rates reduced to the level prevailing in GPC's territory was also unconstitutional.

The first order to be issued by any regulatory body on liberalized depreciation under the new tax law was granted by the Michigan PSC in the case of Detroit Edison Co.[10] The company asked the PSC to use the "Sum of the Years-Digit" method in computing tax depreciation allowances as well as the use of the "reserve" method to account for tax deferral.

Company witnesses conceded under cross-examination that this tax deferral was akin to a liability with a long maturity and, like any other accounts payable, was interest free.

highlights of the coming year

Interest rates will be basically stable with any changes on the upside. ''New money'' financing will not establish a record but common stock financing will be higher.

Look for common stock splits if prices of electric company stocks go much above $60 a share.

Common stock dividend payments will be higher.

Rate increases will fall off.

State laws will be amended to change ''fair value'' provisions of regulation to ''original cost.''

references to 1954 issues of Electrical World

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5. 11/22 p 64
6. 5/24 p 16
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9. 12/13 p 99
10. 12/6 p 6

PUBLIC RELATIONS
& ADVERTISING

v. craig richter associate editor

diamond jubilee dominated year

The lights shone brightly on the 1954 Diamond Jubilee year. This celebration dominated all public relations and advertising activities for the 12 months. The goodwill generated should continue to bear fruit in 1955.

The year also saw companies and associations continue vigorous programs of advertising and educational efforts to spread a better understanding of the industry and its problems and to counter attacks by opponents.

The Light's Diamond Jubilee celebrations got off to an early start in Miami where spectacular displays in conjunction with the Orange Bowl game Jan. 1 paid tribute to Thomas Alva Edison's invention of the electric light bulb.[1] This was a cooperative venture of Florida Power & Light Co, General Electric Co, and the Orange Bowl Committee. At the same time Atlantic City Electric Co kicked off its celebration, tied in with the city's own centennial, by dedicating a new fluorescent lighting system for the Boardwalk.[2]

From then on jubilee activities spread into communities all over the land, running the gamut from banquets to beauty contests and from plant dedications to civic parades. The peak was reached in October.[3]

TV Show a Climax . . . The celebrations were climaxed by the two-hour, all-network television show Oct. 24. This was produced by David O. Selznick aided by a battery of noted writers and a top-flight cast of stars.[4] It wound up with an address by President Eisenhower. As the year was closing out, favorable response in the form of letters and press reports was still pouring into N. W. Ayer & Son, Inc, advertising agency which handled the promotion.[5]

N. W. Ayer, ECAP agency, noting a trend among audiences away from radio to television, dropped its radio work[6] and concentrated on the "You Are There" television show and on national magazine advertising. This was the third season for the program.[7]

PIP, through Bozell & Jacobs, Inc, introduced "Better Living Television Theater," a dramatic weekly series portraying contributions made by American industry toward better living.[8] The PIP workshop conference in St Louis last October reviewed the industry's successes, progress, and minor setbacks in its attempts to advance power programs and policies in key regions.[9]

PUAA membership enthusiasm during the year was high. The Better Copy Contest drew over 2,000 entries in 22 classifications.[10] A PUAA survey of advertising expenses found that utilities were spending more money per customer but less in terms of per cent of gross revenue.[11]

Reddy Kilowatt Service added new clients during the year. Reddy also teamed up with nine Southwestern electric companies to bring the industry a new selling tool—color television commercials. Eight 20-second spots were made available to promote appliances and lighting.[12]

General Electric Co and Combustion Engineering, Inc, threw their support in advertisements behind the five New York electric companies seeking to undertake redevelopment of Niagara Falls.[13]

the outlook for 1955

There probably will be no change in normal annual increase in advertising budgets of about 5%.

Company informational activities in Washington will be stepped up to meet the changed composition of Congress and the threats of further attacks on private utilities.

National advertising and educational themes will be aimed at supporting the ''partnership'' policy; ensuring fair treatment for private utilities on controversial projects; telling the story of tax inequality and the facts about TVA; supporting the five-company plan for Niagara.

references to 1954 issues of Electrical World

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12. 4/19 p 126
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    3/22 p 114

jeanne bernhardt news editor

niagara—still an undecided issue

The struggle over development of 1.1 million kw of additional power at Niagara Falls was the big news for utilities in the Northeast this year, and the issue remains unsettled.

Although the bill providing for development of Niagara power by five private utilities in New York State won an easy victory in the House in the first session of the 83rd Congress in 1953, the measure ran into opposition on the Senate side in the second session. The Senate Public Works Committee conducted extensive hearings on these bills:[1]

- Miller-Capehart (private development)
- Ives-Becker (New York State development with no federal preference clause)
- Lehman-Roosevelt (state development with a federal preference clause)
- Case (letting Federal Power Commission decide the matter).

The newly appointed chairman of State Power Authority, Robert Moses,[2] went before the Senate committee and urged adoption of the Case bill rather than the Ives-Becker bill introduced at the request of Gov Thomas Dewey.[3] Chances for state development would be good, however, if Case bill were adopted as FPC must give state bodies preference in developing hydro resources, other factors being equal.

Finally in June, the Senate Committee voted out the Case bill 8 to 5.[4] But the bill was never scheduled for debate on the Senate floor.[5] This means Niagara legislation will have to start all over again in the 84th Congress convening in January. Private utilities plan to back a new bill for private development next year.

One other incident during the year may have a bearing on the Niagara situation, although even this is in dispute. The U. S. Supreme Court upheld a lower court ruling to the effect that state-granted water-use rights do not "evaporate" when encompassed in a federally licensed hydro project. Some observers felt this decision gave state authorities a veto over federal water power licenses such as the one sought for Niagara.[6] But Niagara Mohawk's Pres Earle Machold declared the decision actually strengthened the utilities' case.[8]

While its efforts to obtain a license for Niagara were stalemated, New York Power Authority was able to break ground for its St. Lawrence project this summer, after legal obstacles were cleared away.[10]

debate will start over again

As in 1954 the question of who shall develop more power at Niagara Falls promises to be a hotly debated issue. Bills for private development and for New York State development are certain to be reintroduced when the 84th Congress convenes. The same goes for the Case Bill.

New York Gov-Elect Averell Harriman called for state development with preference in sale of power to public groups in his successful election campaign. And it is possible he may run into conflict with State Power Authority Chairman Robert Moses who last year backed the Case bill. Harriman is not likely to get a chance to pick his own SPA chairman for a few years. Chairman is selected by SPA members, and at present majority is with Moses. It would be 1957 before Harriman could get a majority by appointing his own men to replace members whose terms expired.

Democrats would not be happy at letting FPC decide the matter even though the state would have a good chance of getting a license. The FPC specifically rejected all efforts to write a federal preference clause into the license it granted New York for the St. Lawrence project.

references to 1954 issues of Electrical World

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10. 2/8 p 67; 6/14 p 94

david rea southeastern editor

southeast developments significant

Highlights in the Southeast during 1954 that may influence utilities throughout the country were:

1. A decision by Mississippi Supreme Court granting that power companies can be liable for devaluation of property along its lines which are located on a highway right-of-way.

2. Congressional action endorsing the GOP power policy by clearing the way for Alabama Power to develop the Coosa River.

3. And lack of action by Interior Department on disposal of Clark Hill power.

Devaluation of Property . . . In Mississippi the Supreme Court held that an electric utility can be liable for devaluation of property along its power lines which are located on a highway right-of-way.[1] The majority opinion, of the 5-to-4 decision, granted that power companies have a legal right to construct lines along the right-of-way. However, it said that the original agreement through which the right-of-way was obtained by the state does not include compensation for damage caused by such lines.

First application of the Administration power policy was the approval by Congress of the development of the Coosa River by Alabama Power Co.[2] The bill, which sailed through all legislative channels, suspends the Army Corps of Engineers authorization to construct the project and gives the "green light" to the company.

Alabama Power has obtained a preliminary permit from the Federal Power Commission that is effective until June 27, 1956.[2] And investigations have started on the project.

Most controversial situation in the Southeast is the disposition of Clark Hill power. After a year of debate and meetings there has been no decision by Interior Department.[4]

At issue is the question of who gets title to the power. The rural electric co-operatives want unlimited title at the bus bar. However, under the tri-contract proposal made by Interior, Georgia Power Co would get title, firm the power, and sell to preference customers in amount and at rates specified by Interior. The company would also furnish additional power requirements to the co-ops.

This procedure maintains the long-established customer-company marketing relationship. Moreover, the government does not assume responsibility for supplying all power needs of the co-ops.

The co-ops argue that the tri-contract proposal circumvents the preference clause as it gives Georgia Power first crack at the power. Therefore, Georgia Electric Membership Corp, representing 23 co-ops, submitted a counter proposal. This would give title to the co-ops who claim they will be able to firm the power. GEMC believes that Georgia Power will wheel the power rather than force the possibility of competing lines.

Interior has said it cannot act affirmatively on the co-op proposal until the co-ops work out a plan for collecting money to pay the government and establish ability to firm the power. This the co-ops haven't done, and there the dispute stands. At present, South Carolina Electric & Gas Co is buying the output from Clark Hill.

Securities and Exchange Commission cleared Mississippi Power & Light Co of charges made by its Secretary-Treasurer J. D. Stietenroth, since replaced.[5]

developments to look for in '55

Rates for Santee-Cooper customers may increase.

Long-range construction programs will be enlarged considerably.

Emphasis will be placed on steam stations, however, hydro construction will also increase.

Interior Department will approve tri-contract proposal for disposal of Clark Hill power.

references to 1954 issues of Electrical World

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   10/11 p 6
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   12/6 p 62

edward allen midwestern editor

dixon-yates contract began battle

Groundwork for the Dixon-Yates controversy (also see p 00) was laid early in the year with a declaration by President Eisenhower reinforcing his previously announced policy of no new starts on federal power projects.[1] TVA power experts and area politicians advocated a new steam plant in the western part of the TVA system, near Memphis.[2] TVA rejected an offer to buy power from private companies.[3]

The President directed AEC to shift 600,000 kw of load from TVA to private utilities,[4] and Dixon-Yates proposed to build a steam plant at West Memphis, Ark.,[5] to supply this power. This precipitated the Dixon-Yates controversy which has raged throughout the year[6] and promises to continue.

Although the contract has been signed by AEC, it still faces two hurdles: 1. SEC approval of financing for the West Memphis steam plant, and 2. continued Democratic attacks.[7] The present issue boils down to whether TVA will continue to build steam plants. On a broader scope it is a question of whether the federal government will provide all of the nation's power requirements as set forth in a letter by President Eisenhower.[8]

Missouri Basin Projects in News . . . Missouri Basin developments were also very much in the news in 1954. Power from the project was over subscribed.[9] Steps were taken to allocate it.[10] Companies and co-ops were told to plan steam plant capacity to back up Missouri Basin power after 1956.[11] Ft. Randall project's first unit was placed in operation.[12]

How far the Missouri Basin development will go toward federalizing power facilities of this wide area will depend on the political atmosphere in the years to come. One fact is evident, however. Load building activities will be on a major scale when basin power becomes available. Some organizations are already making plans in that direction.

Detroit Edison's purchase of a 300 Mw steam turbine-generator unit from the Allis-Chalmers Mfg Co[13] marked another step in the upward march of turbine-generator unit sizes. There is every indication that this is just a step on the way upward and that more and larger units are in the offing. Units of 500 Mw are possible.

Detroit Edison Co scored another notable development with the 150-Mva transmission link between the U. S. and Canada.[14]

An unusually hot summer in the West Central and South Central regions of the country caused sharp load increases over a wide area this summer.[15] Result was changes in distribution practices with more capacitors, particularly secondary capacitors, special series capacitor applications, many more distribution transformer installations, and shorter secondary buses.

predictions for 1955

Dixon-Yates controversy will continue in limelight.

Missouri basin development will follow pattern of cooperation between public and private power agencies.

Size of air conditioning load increase will be determined by the season but will continue and spread over larger areas.

Electric space heating will be further explored as a means of improving load factors where air conditioning loads are growing.

Economic dispatching will find its way to more systems.

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15. 4/19 p 110 11/1 p 81

francis j. kovalcik western editor

northwest plans to increase capacity

Outshadowing all other western events during 1954 were the mushrooming efforts to meet the power shortage predicted for the Pacific Northwest after 1960.[1] These efforts stemmed from the realization that the federal government no longer would accept utility responsibility in the area.

Ability to build large hydroelectric projects was the reason behind creation of Pacific Northwest Power Co[2] by four private utilities. Among projects studied was Bruce's Eddy on Idaho's Clearwater River and two Snake River projects. It will also investigate the feasibility of an atomic power plant.[3] Three of the founder companies offered the Corps of Engineers $350,000 to pay for the preliminaries needed for the 1,105,000-kw John Day project on the Columbia.[4] Earlier, one of the companies, Portland General Electric, proposed a partnership arrangement for John Day whereby public, private, and federal agencies would combine to build it.[5]

Council Active in Planning . . . Future power developments for the Puget Sound area will be planned by the Puget Sound Utilities Council consisting of two municipal utilities, two public utility districts, and a private company.[6] In addition to scheduling projects of the members, the council will look into an atomic energy plant for Washington.[7]

The council proposed to build the 10.6-million acre-ft Mica Creek dam on the Columbia in British Columbia, with the Canadians to build and operate the powerhouse.[8] With this upstream storage, more capacity could be installed at United States plants on the Columbia. Then the council offered to participate in the addition of a third powerhouse at Grand Coulee and two more generators at Chief Joseph.[9]

Additional upstream storage to firm up U. S. plants would be provided through a proposal of Kaiser Aluminum & Chemical Co to build a 3-million acre-ft storage dam on Arrow Lakes in British Columbia.[10] Canadians would get 20% of the firmed-up power. In answering the Canadian federal government's objection to the plan, British Columbia said it might do the job with Kaiser's backing.[11]

To hasten more generation through implementation of the Administration's partnership plan, a number of private and public agencies offered to work with the federal government. On the Cougar Dam project Eugene (Ore.) Water & Electric Board would add 28,000-kw power facilities to the flood-control project.[12] On the Columbia Chelan PUD hopes to see three hurdles cleared that bar development of the 585,000-kw Rocky Reach project.[13] And with the help from other public agencies and a finding of feasibility by Army Engineers, Franklin PUD would undertake the 130-million, 325,000-kw Ice Harbor project on the Snake River in Washington.[14]

Nine private companies in the Upper Colorado Basin suggested a federal-private marketing plan for power from the proposed Upper Colorado storage project.[15] Essentially the same group plus several manufacturers was authorized by AEC to form the Rocky Mountain Nuclear Power Study Group.[16]

On California's Stanislaus River three power and irrigation projects were endorsed as partnership affairs.

look for these events in 1955

Licenses may be granted for ''partnership'' projects, perhaps Priest Rapids and Cougar.

Regional public credit corporation to finance large hydro projects in the Northwest will be urged but not created.

U.S.–Canadian differences over sharing of benefits of upstream hydro and storage projects may be settled, but chances are slim.

No rise in federal power rates is expected.

Start of natural gas lines to Pacific Northwest.

references to 1954 issues of Electrical World

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12. 1/18 p 15; 2/22 p 90
13. 3/29 p 63
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"FACTORY FRESH" UNTIL YOU INSTALL THEM!

Plastic jackets now protect G-E distribution transformers during storage

Plastic jackets now protect G-E distribution transformers—whether stored inside or outdoors—from dust, dirt, fly ash, cinder dust, and moisture, and also help protect the units from minor nicks and scratches. Retouching in the field is practically eliminated. Placed on transformers before crating, the new jackets are used for all ratings 167 kva and below.

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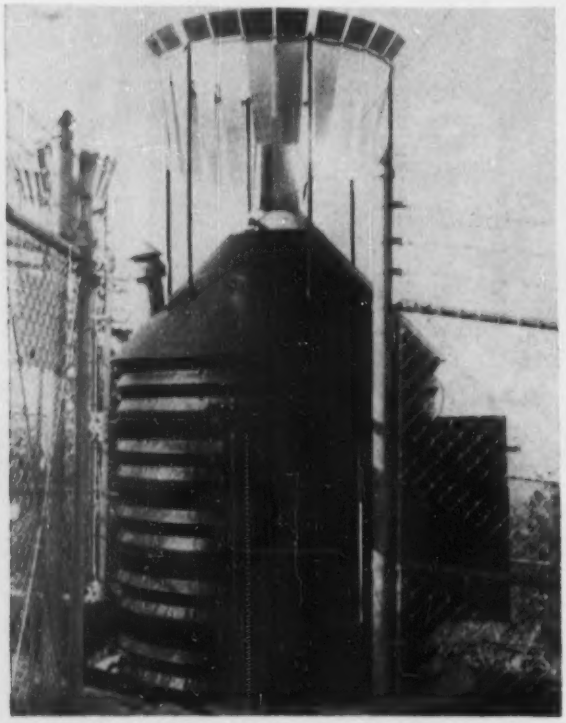
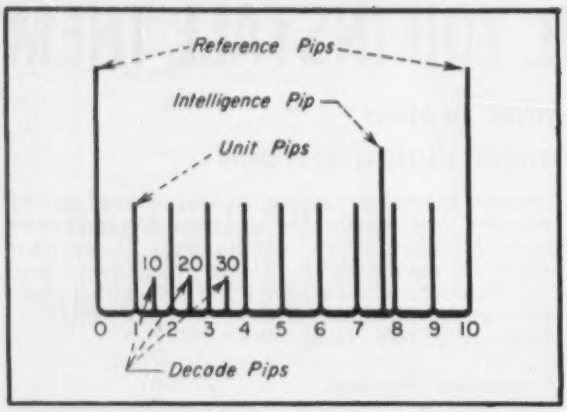
Unattended Radio Gages Report Rainfall

New and improved rain gages in the Bureau of Reclamation's radio-reporting network allow better control of water in the northern California portion of the Central Valley Project. The reliable electronic gages can transmit and operate unattended for weeks in remote mountainous locations. With six radio-reporting gage stations, CVP can determine quickly when and where potential flooding rains have fallen.



NEW RAIN GAGE is housed in a metal shelter that is temperature-controlled to protect equipment against subfreezing temperatures



OSCILLOSCOPE IMAGES are created by impulses sent out by the rain-gage transmitter. This image reads 37.75 in. of precipitation

Heart of the new gage is a small photoelectric coding device. It translates inches of precipitation into radio impulses which are transmitted to a central control room. Impulses are projected in graph form on a cathode-ray oscilloscope.

The coding device consists of four main parts. First is a light source in a cylindrical sleeve. A horizontal slit in the sleeve projects light through a concentrating lens. The second part comprises a motor-driven metal disk with a helical slit spanning half a revolution; 11 uniformly-spaced small holes on a concentric semi-circle spanning the other half revolution; and nine holes on a progressively increasing radius, each hole located midway between holes of the group of 11. The third component is a photoelectric cell inside a fixed cylindrical sleeve having a horizontal slit. This sleeve is inside a rotatable sleeve having a 360-deg. spiral slit. The last component is an indexing step-disk which revolves one step for each revolution of the rotatable sleeve.

The revolving disk is set between the light source and the photoelectric cell. The light beam is projected through the lens onto the disk as a single horizontal line along its radii. The outer cylinder of the photoelectric cell is revolved once for each 10 in. of precipitation in the storage can by a weighing device through a gear train. Intersection of the spiral slit in the outer cylinder with the horizontal slit in the inner cylinder forms a single small aperture. Horizontal position of this aperture indicates precipitation in fractions of inches from 0 to 10.

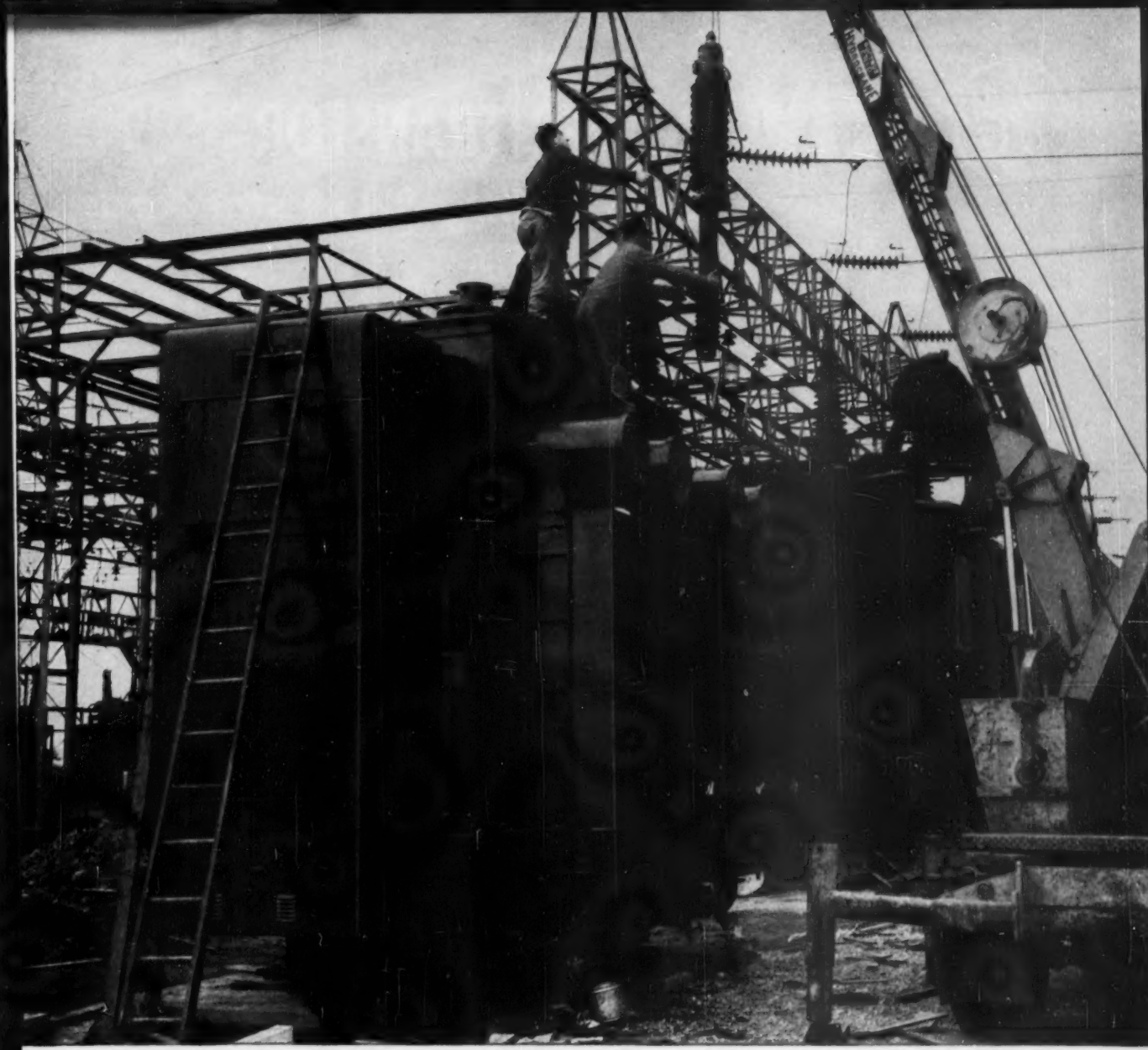
Light passing through the helical slit in the revolving disk becomes a sweeping beam. It scans the outer cylinder of the photoelectric cell and passes through the aperture formed by the spiral and the horizontal slits. The 9-hole and 11-hole groups provide three separate sequences of light pulses which have an angular relation independent of disk speed. As light pulses strike the photoelectric cell, they create current impulses in the radio which are transmitted.

Impulses are translated by the oscilloscope into an image (See accompanying drawing). The larger the hole in the rotating disk, the higher the pip. Light passing through the helical slit causes the intelligence pip; light passing through the 11 holes causes the unit reference pips; and light passing through the nine holes causes the decade pips.

The oscilloscope can produce a "folded" scale. Thus, the 180 deg of travel of the intelligence pip is superimposed on the 180 deg of uniform scale provided by the reference and unit pips. Interpolation for precipitation of less than 1 in. is handled through a magnification feature of the oscilloscope. This provides an expanded image of the reference pip between two unit pips. The oscilloscope screen has a uniform coordinate grid which permits interpolation to 0.01 in. of precipitation.

Radio transmitters and mechanical and electronic

(*Continued on page* 80)

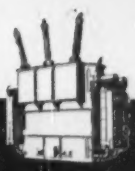


READY TO CONNECT IN 4 DAYS!

It took six men just four days to move this 40,000-kva General Electric transformer 300 feet from the railroad car, assemble and ready it for connection to the line at the Northfield substation of the Cleveland Electric Illuminating Company.

Like all G-E power transformers, this unit was shipped upright so that it did not have to be tipped at the site . . . and for faster, easier installation, it arrived in a one-piece tank so that no top-section needed to be field-assembled.

The next time you compare transformers, don't forget to include ***installation cost*** in your economic analysis. You'll find that you can often make big savings by using G-E units. General Electric Company, Schenectady 5, New York. 421-21



Power Transformer NEWS

Progress Is Our Most Important Product

GENERAL ELECTRIC

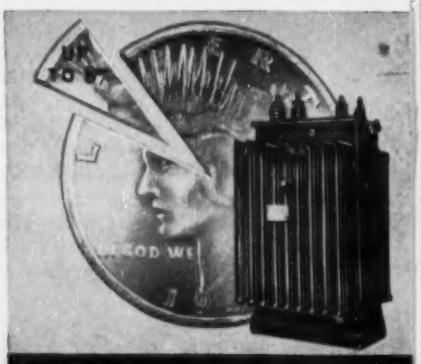
RM POWER TRANSFORMERS

the benefits of ASA standards

RM* brings you all these benefits

Repetitive Manufacture gives you the economy of a standardized product, yet with optional ratings and accessories sufficient to meet most special needs. Ordering is simpler, shipment is many weeks faster, and prices are up to 8% lower than those of non-standard units.

**RM is the G-E designation for ASA-standardized power transformers 69 kv and below, 501 through 5000 kva single-phase, and through 10,000 kva three-phase.*



LOWER PRICE

plus.....High dielectric strength

from vapor-phase drying which removes entrapped moisture

When you need a transformer in the medium range, order a General Electric Repetitive-Manufacture transformer, and you'll get all the benefits of ASA standards plus many extra advantages that give you better performance, easier handling and less maintenance.

HIGH DIELECTRIC STRENGTH, for example, and better short-circuit protection are assured by an RM production technique called ***vapor-phase drying.*** Entrapped moisture, if left in the coil assemblies, would lower the dielectric strength of the insulation. Later this same moisture could seep out—causing shrinkage, loose windings, and a weakening in short-circuit stress resistance.

Vapor-phase drying removes the moisture which is present in the insulation during manufacture. At the new Medium Transformer Plant, all units rated above 15 kv and 2000 kva are given this unique treatment which uses vapor from boiling oil. As shown at left, the hot oil vapor permeates the windings and condenses on the coils—releasing the latent heat of vaporization. It is this heat which warms the windings and insulation to the point where, in combination with a high vacuum, moisture is driven out of the structure and carried away. These "pre-shrunk" windings are then securely tightened into a compact coil stack which will remain tight in service giving maximum resistance to short-circuit stresses.

MANY OTHER BENEFITS result from the advanced methods and processes used in General Electric's new plant at Rome, Georgia. These include a stronger liquid-tight tank from submerged arc welding, superior rust prevention because new Super Melaglyp lasts up to 150% longer, quicker delivery from faster, conveyorized production. Built solely to produce power transformers in the medium transformer range, this plant serves utilities and industries by turning out better products in shorter time. You can get full information about RM power transformers by contacting your nearest G-E Apparatus Sales Office, or by writing for Bulletin GEA-6108 to General Electric Company, Section 422-11, Schenectady 5, New York.

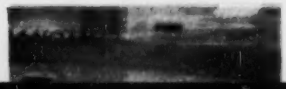
Progress Is Our Most Important Product

GENERAL ELECTRIC

SIMPLIFIED PURCHASING

SHORTER SHIPMENT

G.E.'s NEW ROME, GA., TRANSFORMER PLANT—built specifically to meet the growing trend to standardized power transformers.



Rainfall Gage

(*Continued from page* 76)

equipment in each gage station are protected by temperature-controlled metal shelters. A heated precipitation gage intake tube provides protection against subfreezing weather.

Heat for the inner surfaces of the tube is drawn from the flue gases of the gage station space heater through a heat exchanger. This unit consists of a heat generator and a vapor condenser with Freon 114 as the heat-transfer medium. The generator is composed of 12 turns of ⅜-in. OD copper tubing wrapped tightly around a flue section consisting of a 28-in. length of 4-in. OD copper flue. Vapor condenser consists of two coils of ⅜-in. OD copper tubing wrapped around the inner of two concentric cylinders that make up the intake tube. The exchanger will melt all snow falling into the intake tube.

Space heaters burn lp gas and are controlled by thermostat to maintain a temperature of 65F ±2 deg in the station. As an additional safety measure, anti-freeze solution is used in the gages.

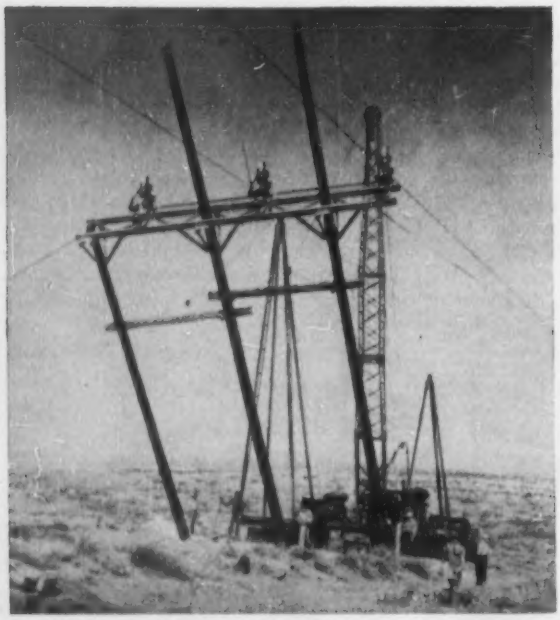
The six remote rain-gage stations are located in the 4,500 sq mile drainage area. From these stations, radio impulses of water height are beamed to a relay station near Shasta Dam. Then they are transmitted to the control room of Keswick Dam.

To contact a station, the operator turns a selector switch and presses a contact key. This transmits a signal that energizes the transmitter at the station through a continuously-energized receiver. The signal representing inches of precipitation is returned.

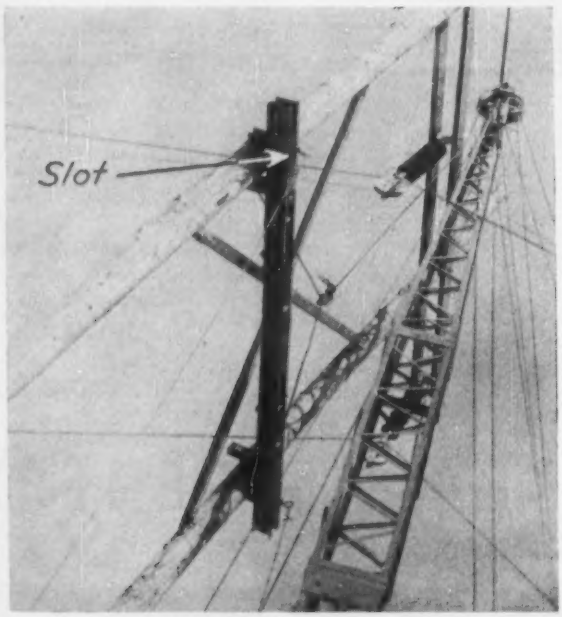
Numerical value of the signal is teletyped to CVP water control section in Sacramento. In cooperation with the US Weather Bureau, readings are converted into flood flows by unit hydrographs and flood-routing methods. And time of the expected flow is calculated. Water releases from Shasta dam then can be regulated according to predicted flow.

Statistics for Field Radio Batteries

Quantity	Type	Average Life
45	Dry cell—1½v	Three months
2	B-battery—45v	One season
3	Storage battery —6v	Recharge every month



COMPLETED 115-KV STRUCTURES with switches mounted and conductors in place are raised by two winch trucks and two spreader bars



SPREADER BAR has U-shaped pole grips that are held in place by the lifting cable. When the winch line is slackened, bar frees itself

H-Frames Raised with "Self-Detaching" Bar

H. O. HODSON, Vice President, Southwestern Public Service Co, Amarillo, Texas

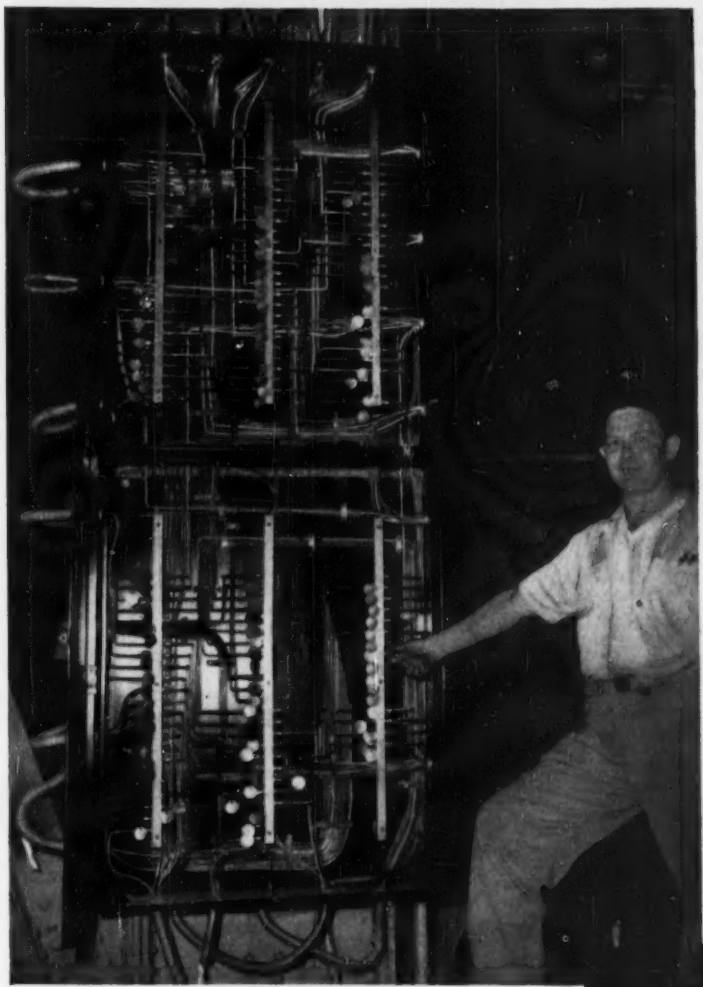
Transmission line construction is speeded with a "self-detaching" spreader bar designed by Southwestern Public Service Co, Amarillo. The device is used to raise 115 kv H-frame structures that are completely built on the ground and have conductors and ground wires in place.

Two bars and two winch trucks are used to raise three-pole structures that mount pole-top switches. A single spreader bar and a single winch truck are used for lifting completely assembled two-pole H-frame tangent structures into place.

The spreader bar consists of two 8-in. steel channels welded back to back with steel spacers. Two U-shape

FOR INSTRUMENTATION AND CONTROL

Cabled Tube



Some time ago Revere ran an advertisement featuring Crescent Armored Multitube for use in pneumatic and hydraulic instrumentation and control systems. The advertisement created so much interest that we thought you might like to see a photograph of an actual installation. The Control Board Junction Box shown here has 22 runs of Multitube coming into this box comprising 224 Revere Copper Tubes of 1/4" O.D. The picture was taken in the Glenwood Landing, N.Y. Power Station of the Long Island Lighting Company. The tubes go to instruments that report information on temperature, main and reheat steam pressure, boiler feed and condensate pump pressure, fuel oil and gas pressure, liquid levels, tide level and for the control of fuel feed, draft dampers, boiler drum water level and various control valves.

This is a relatively new use for Revere Copper Tube, but it is an important one in these days when new ways are being found to obtain process information more quickly and accurately, or to achieve automatic control. Crescent Armored Multitube is made by Crescent Insulated Wire & Cable Co., Inc., Trenton 5, N.J., in lengths up to 1,000 feet. It consists of a group of long tubes twisted together in cable form, protected by a flexible interlocked galvanized steel armor, or by plastic, or both. As many as 19 tubes, 1/4" O.D., can be cabled, with one tube in each layer color-coded. Larger tubes can also be cabled, including 5/16", 3/8" and 1/2". This construction affords protection during shipment, installation and use, and speeds up installation greatly. For further information, write Crescent, and for tube in copper and aluminum, see the nearest Revere Sales Office.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y. Sales Offices in Principal Cities, Distributors Everywhere.

SEE "MEET THE PRESS" ON NBC TELEVISION, SUNDAYS

Control Junction Box at Power Station of Long Island Lighting Company, showing use of Crescent Armored Multitube. Note that relatively sharp bends can be made without damage to the cabled copper tube.

Construction of Crescent Armored Multitube.

pole grips of ½-in. steel plate fit between the channels to secure the poles. The distance between these grips may be adjusted for different pole center-line spacings.

Half of the back of each grip is slotted to take the lifting cable. The cable end is finished in an eye-nut to prevent it from going through the slot and to provide an attachment for a ground line.

The spreader bar is placed on the structure and ends of the lifting cable are passed around the pole and then through the slot in the top of the pole grip. As the line is taken up, the cable automatically tightens the lifting bar to the poles. After the structure is raised, the winch line is slacked off to allow the cable ends to be slipped out of the grip slots by a tug on the ground ropes. Then the entire assembly can be lowered to the ground by the truck winch line.

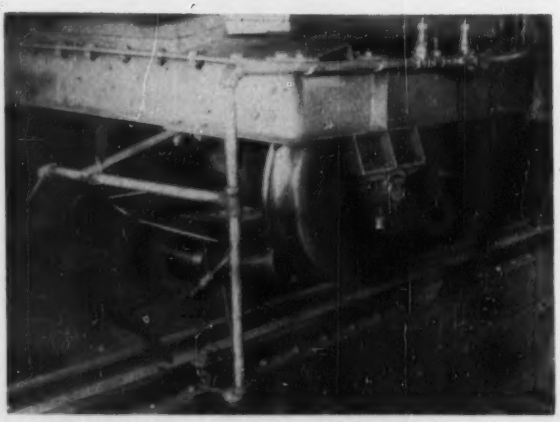
Air Jets Simplify Coal-Conveyor Housekeeping

LEROY J. DUGGAN, Beech Bottom Power Co, Power, W. Va.

Air jets installed on the travelling coal tripper have reduced a long and tedious job of cleaning in the coal-conveyor area. Coal and dust are blown off the conveyor deck against a baffle mounted on the tripper and deflected downward into the coal bunker.

When the air hose is connected to the tripper after each filling, one pass over the conveyor, requiring only six min, is sufficient to clean the deck from end to end. No clouds of dust are raised. Adjacent areas can be kept relatively clean, and intervals between vacuum cleaning can be increased.

Now, the cleanliness of the coal-conveyor area inside the boiler house compares favorably with other parts of the plant. No dust is allowed to accumulate on any of the structure or equipment due to the ease of cleaning and the short time required for the operation.



AIR JETS that remove dust on coal tripper are connected to compressed air hose. Baffle plate that deflects dust into bunkers could not be shown without concealing jets

Hydraulic Crane Reduces Costs of Street Lighting Work

B. W. HAFELI, Engineer, Underground Lines, Detroit Edison Co. Detroit, Mich.

WORKING PLATFORM or crow's nest is attached to upper boom. Controls for crow's nest are located both on turret and in crow's nest

Hydraulically operated crane equipment has made street lighting construction and maintenance work easier and reduced costs for Detroit Edison Co. Because of its reach and maximum working height, about 36 ft, the equipment is particularly adaptable to working over parked cars and on very high long-armed posts. It is also used for occasional aerial cable and pothead maintenance.

The unit is mounted on a standard 2½-ton truck chassis equipped with a specially designed body for street light maintenance. It consists of a rotating turret, a lower boom, and an upper boom, all of which are hydraulically operated. The standard model is modified to the extent of mounting a hoist motor on the turret and adding a tubular extension, load line, and hook to the lower boom.

The lower boom is used as a crane to lift replacement street light posts from the truck and set them in position for installation. The maximum load capacity of the lower boom crane is 1,500 lb. A working platform or crow's nest is attached to the upper boom.

"Deadman" hydraulic control levers are used throughout. Controls for operating the crow's nest are installed both on the turret and in the crow's nest. The lower boom

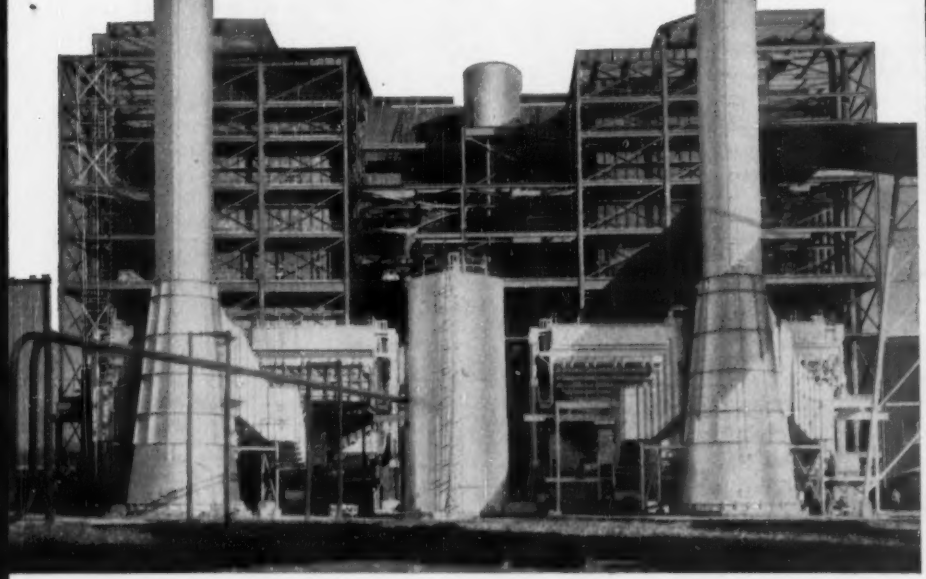
(*Continued on page* 86)

What are they using at Meramec?

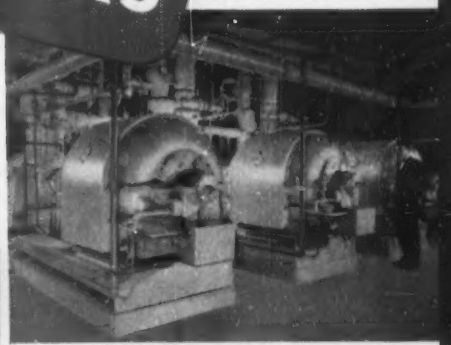
Another utility uses Allis-Chalmers motors. At Union Electric Company's new Meramec plant, all motors for all auxiliaries were furnished by Allis-Chalmers.

Allis-Chalmers builds a complete line of integral horsepower motors for power plant service. Your A-C representative will be glad to help you select the best motors to meet your needs.

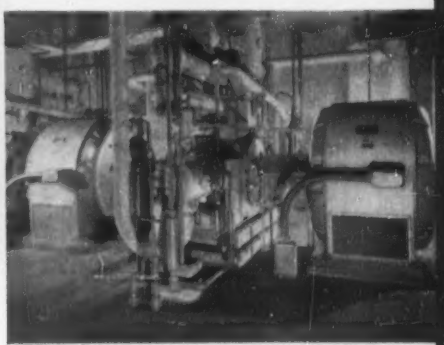
ALLIS-CHALMERS
Auxiliary-Drive
MOTORS



Built in the modern semi-outdoor style, Union Electric Company's Meramec station has two units with a total installed capacity of 250,000 kw.



Three of six 1500-hp, 3580-rpm, 4000-volt Allis-Chalmers two-pole motors driving boiler feed pumps.



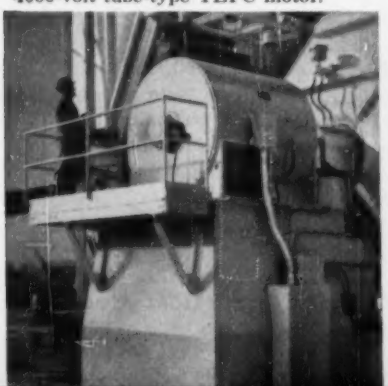
Two of three 300-hp, 353-rpm, 4000-volt Allis-Chalmers squirrel-cage motors driving soot blower air compressors.

ALLIS-CHALMERS

Milwaukee 1, Wisconsin

A-C

Each induced draft fan is powered by an Allis-Chalmers 1000-hp, 710-rpm, 4000-volt tube-type TEFC motor.



Four of these 500-hp, 425-rpm, 4000-volt vertical pipe-ventilated motors drive condenser circulating pumps.

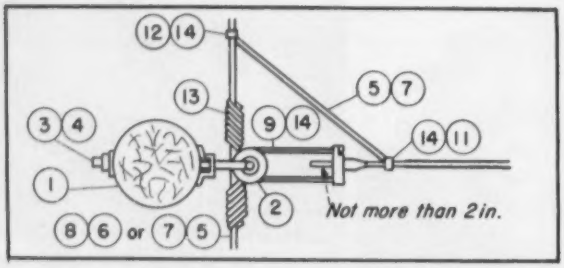
These compressors provide air for service lines . . . are driven by Allis-Chalmers 100-hp, 1170-rpm, 440-volt cage motors.

A-4526

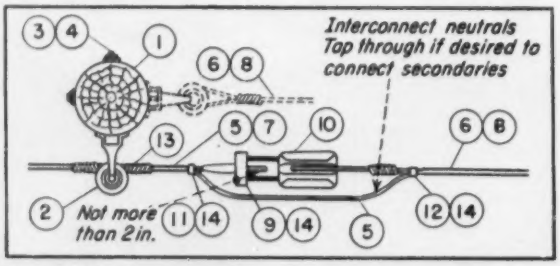
Automatic Clamp Designed to Terminate

Three methods for pole-termination of aluminum secondaries through self-locking dead-end clamps are adapted from Construction Standards of Long Island Lighting Co

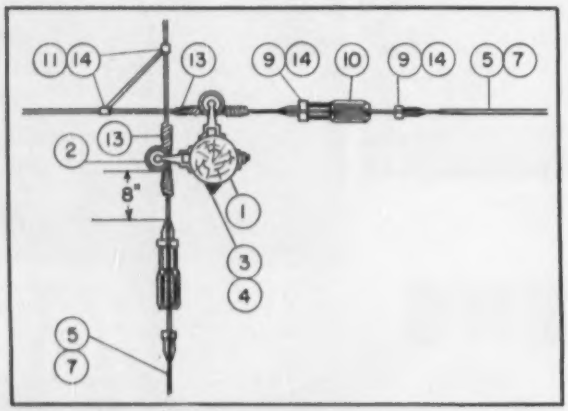
F. T. HAUSLE, Distribution Design Engineer, Long Island Lighting Co, Mineola, N. Y.



ALUMINUM SECONDARY tapped to copper or aluminum through-line on same rack



ALUMINUM-TO-COPPER through-line connection made by shifting rack to field side of pole



STRAIN INSULATORS are installed as line breakers in the aluminum secondaries

NOTES

1. Remove tape from end of automatic dead-end clamp before inserting wire.
2. Do not run more wire through automatic dead-end clamp than is necessary.
3. Before inserting aluminum wire into automatic dead-end, item 9, coat wire with oxide inhibitor and brush in with wire brush.
4. In all cases of an aluminum-to-copper connection, place aluminum above the copper.
5. Before using connectors, items 11 and 12, apply inhibitor to the aluminum conductor, brush conductor with wire brush, apply inhibitor to split-bolt connector, then make connection.

1. Pole, creosoted treated pine
2. Secondary rack
3. Bolt, machine, ⅝ in
4. Washer, square, 2¼x2¼x2/16 in.
5. Bare neutral aluminum conductor on top spool
6. Bare neutral copper conductor on top spool
7. Weatherproof aluminum conductor on other than top spool
8. Weatherproof copper conductor on other than top spool
9. Automatic dead-end clamp (see Notes 1, 2 and 3)
10. Porcelain strain insulator
11. Connector, split bolt, aluminum-to-aluminum (see Note 5)
12. Connector, split bolt, aluminum-to-copper (see Notes 4 and 5)
13. Tie wire, aluminum, bare and solid
14. Oxide inhibitor (see Notes 3 and 5)

Aluminum Secondary Conductors at Poles

ALL-ALUMINUM SECONDARIES are readily terminated through automatic dead-end clamps in about one-third time of former methods

A dead-end clamp illustrated terminates all-aluminum secondary conductors at poles at minimum of installation labor. The device is used presently on 1/0 all-aluminum conductors only. Three applications are shown.

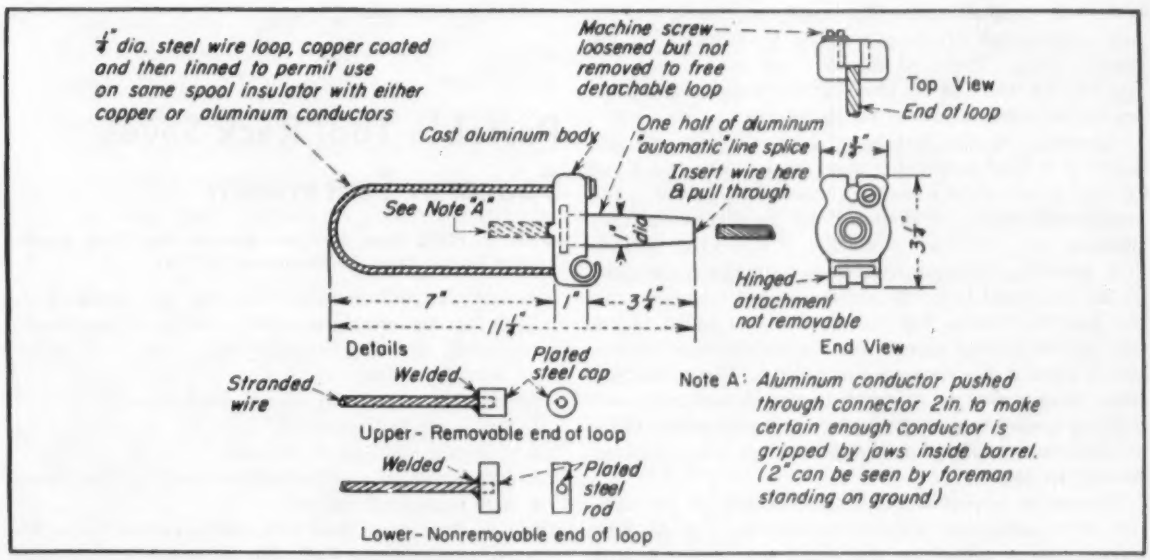
The LILCo-developed clamp consists of one half of an all-aluminum "automatic" line splice coupled to an aluminum yoke, also a tin-plated copper-clad steel-wire loop detachable at one end of the yoke. The tinned loop is placed around a secondary spool insulator supporting either copper or aluminum conductors without danger of electrolytic action.

Tension and vibration tests were made on new and reused units before the connector was adopted as standard. Approximately 600 units were installed experimentally in the field for one year to check comparative installation costs and performance.

Only precaution necessary is to avoid pulling an excessive amount of conductor through the connector in taking up slack. Otherwise small particles of aluminum from the conductor will collect in the connector teeth which may cause slippage under normal tensions.

Cost of this dead-end unit is slightly less than that of other methods, and installation labor is only one third. Based on anticipated 1954 usage of 14,500 units, the savings in material and labor are expected to be $4,500. Labor savings are estimated at 1,250 manhours.

Approximately 8,000 units have been installed on the system. Many have been subject to moderate ice loading and to winds up to 70 mph with no failures reported. However, the company restricts use of aluminum to secondary lines and services in areas one mile or more from the coast to minimize corrosion problems.


¼" dia. steel wire loop, copper coated and then tinned to permit use on same spool insulator with either copper or aluminum conductors
Machine screw— loosened but not removed to free detachable loop
Top View
End of loop
Cast aluminum body
One half of aluminum "automatic" line splice
1½"
Insert wire here & pull through
See Note "A"
Hinged attachment not removable
7"
1"
3¼"
11¼"
Details
End View
Plated steel cap
Welded
Stranded wire
Upper - Removable end of loop
Welded
Plated steel rod
Lower - Nonremovable end of loop
Note A: Aluminum conductor pushed through connector 2in. to make certain enough conductor is gripped by jaws inside barrel. (2" can be seen by foreman standing on ground)

DEAD-END CLAMP has part of an aluminum line splice, an aluminum yoke, and a tin-plated copper-clad loop

Hydraulic Crane

(*Continued from page* 82)

crane controls are mounted only at the turret to help prevent the possibility of overloading the unit by having a workman in the crow's nest while a load is being lifted with the lower boom crane.

Electric motor driven outriggers are provided on each side of the turret with controls installed in the truck cab. A two-way radio is also part of the equipment in the cab.

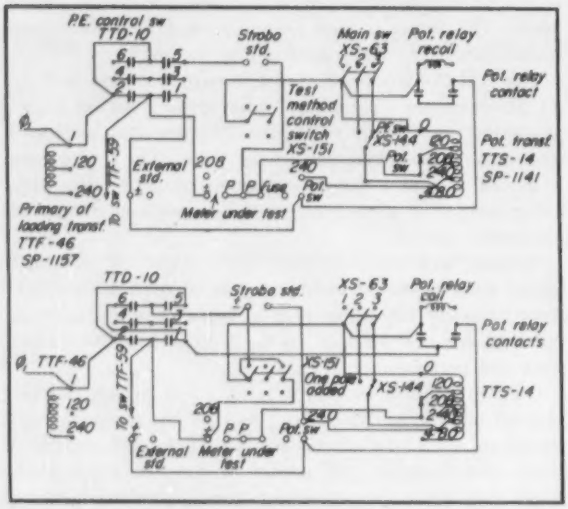


FIG 1—POTENTIAL WIRING was changed to add more flexibility to the purchased test board. Old wiring is above and new below

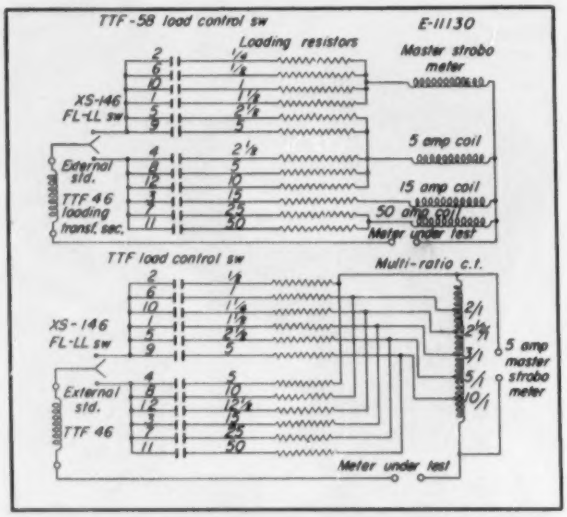


FIG 2—CURRENT WIRING changes consisted chiefly of the addition of a multi-ratio current transformer to the test board

Rewiring Adds Flexibility to Meter Test Board

Flexibility is the key advantage of a specially designed meter test board used by Oklahoma Gas & Electric Co. It will do anything except automatic testing. The stroboscopic counter will work both ways.

Three methods of testing can be used: The snap method, photoelectric count, and stroboscopic. The photoelectric count can be used to stop and start either the meter under test or the standard meter. The board can also be used for any combination of these methods by switches on the control panel. Preferred methods are the stroboscopic test for full load and the photoelectric stopping and starting of the meter under test for light loads.

Flexibility of this test board is particularly valuable where it is used in outlying meter shops. The board can be kept in operation when the photoelectric device or the stroboscopic device, or both, are out for repairs and calibration.

A number of changes were made in wiring connections of the purchased board to add the desired flexibility. On the potential wiring, Fig 1, one pole was added to the test method control switch. On the photoelectric control switch point 2 was connected to point 5. The connection from the potential relay switch to the photoelectric control switch was changed. Photoelectric control switch TTD-10 was rewired. The stroboscopic standard was connected directly to 240 v.

Changes in current wiring consisted chiefly of the addition of a multi-ratio current transformer, Fig 2. This transformer is special for this board but is of standard manufacture and available at nominal cost.

Changes were also made in control switch positions to avoid reaching so far when changing from full load to light load.

The external standard was moved from the drawer to the top of the desk so that it would not be necessary to have the drawer open when testing. This eliminates jarring of the standard by opening and closing the drawer or by bumping the open drawer.

Portable-Tool Rack Saves Space in Storeroom

JOHN W. FORE, Stores Supervisor, Kanawha River Plant, Appalachian Electric Power Co, Montgomery, W. Va.

A steel rack with movable hooks has met requirements for compact but readily accessible storage of medium to heavy-weight or bulky portable tools close to the storeroom issuing window.

Advantages of the rack include the following:

1. Space for 300 items.
2. Complete visibility of all tools.
3. Availability of any tool without moving other items.
4. Safe storage off the floor.
5. Less floor space than with other methods (70 sq ft).
6. No attachment to walls; can be moved to other locations as conditions change.

Operation "Brain Center"

This room is the control, nerve, or "brain center" of the modern public utility system. From this room control cables carry impulses that operate switches, remote control devices, and telemetering equipment. Here men, by means of remotely-controlled switches, set up and break down circuits. It is here that failures of equipment and outages caused by the elements are circumvented.

All of these operations depend upon the sure and dependable performance of Simplex Control Cables. They must be ready to operate under every conceivable kind of condition. These control cables bear a measure of responsibility entirely out of proportion to their size. But they do it with absolute dependability. The safety of many millions of dollars of public utility equipment rests upon these slender cables and the equipment they control.

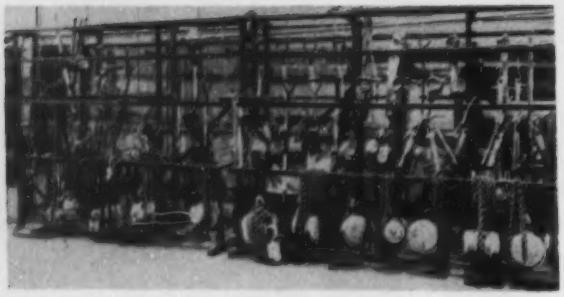
Simplex Control Cables are made in three styles: Anhydrex-insulated and neoprene-jacketed, Polyethylene-insulated and Plastex-jacketed, and Plastex-insulated and Plastex-jacketed. There is a size and a style to meet every operating condition on your public utility system, whether it be to operate equipment at a distance, for telephone and communication circuits, for telemetering devices. Whatever the need, be sure that the vital connecting link between the "brain" and the equipment is Simplex Control Cable.

Your local Simplex representative will be glad to help you with any problem you may be facing which has to do with cables.

Simplex Control Cables

products of

SIMPLEX WIRE & CABLE CO., 79 Sidney Street, Cambridge 39, Mass.



7. Stored tools are kept cleaner than in bins.

The two-section steel tool rack measures 3½ x 20 x 7 ft. It is made of 1⅝-in. A-frame steel channels with movable hooks sliding along slot-side of channels and cost $177 for labor and material.

The rack provides storage for such tools as chain falls, large pipe wrenches, babbitt ladles, bolt cutters, ratchet pulverizer wrenches, hand-operated oil-transfer pumps, lamp-bulb snatchers, pulverizer-ball tongs, carrying hooks, air-drill motors, picks, shovels, pitchforks, steel crowbars, and hot sticks.

Grouted Footing in Rock Costs Up to $300 Less

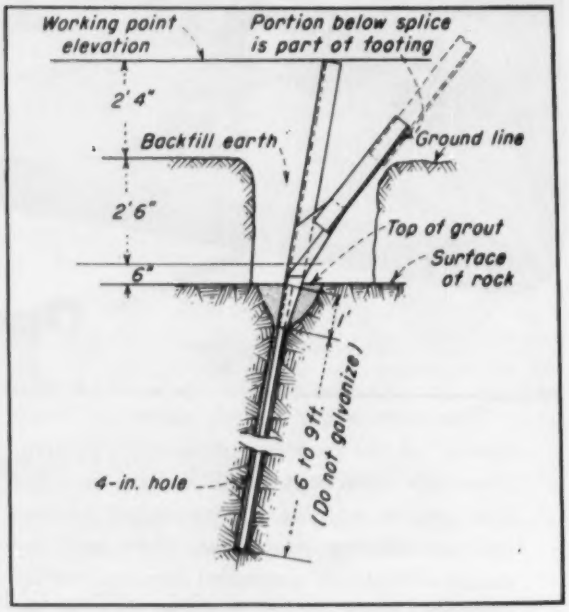
VIRGIL L. HYLAND, Field Engineer, Bonneville Power Administration, Portland, Ore.

Substantial savings in steel tower footing costs are being made with a grouted anchor footing designed for terrain comprised of considerable rock. The new design can save up to $1,600 per mile where numerous rock footings are required. On a 44-mile section of the Bonneville Power Administration's McNary-Maupin 230-kv line in eastern Oregon, use of the grouted footing saved over $70,000.

Where heavy rock is encountered, particularly in rugged terrain, drilling and blasting for a conventional concrete footing can be costly and tedious. Hauling the concrete aggregate to the site also may be expensive. Grillage footings also can be quite costly when installed in rock requiring drilling and blasting.

As against these conventional footings, the new design consists of a stub angle with a 2-in. square deformed steel bar welded to the bottom. Before welding, corners and corrugations on the bar are ground to fit the stub. A ⅜-in. fillet is welded all around the joint. The bar is grouted into a 4-in. hole drilled in the rock to a depth of from 6 to 9 ft. Grout in a 1:1 mixture can be mixed easily right at the tower site.

Installations of the grouted footing show savings of from $200 to $300 per footing as compared with conventional concrete pad rock footing. Design of the grouted footing won for the author a superior accomplishment award and an increase in permanent salary of approximately $200.



Marked Hoisting Rig Speeds Turbine Parts Handling

A. L. SMITH, Maintenance Supervisor, Sporn Plant, Central Operating Co, New Haven, W. Va.

A yellow or colored band marked on the crane operator's side of a hoisting rig, including the double hook, avoids loss of time to adjust slings. The operator can easily observe whether the rig is in the same position with relation to the load each time it is handled. Such marking is also advantageous even when the double hook is used alone, because of its lack of exact symmetry.

The marking is a particular aid in the removal or replacement of turbine shells or rotors. These parts should be suspended from the crane so they will retain a horizontal position throughout the handling operation. If they are not kept level, parts of the turbine with small clearances may be damaged because of rubbing or fouling.

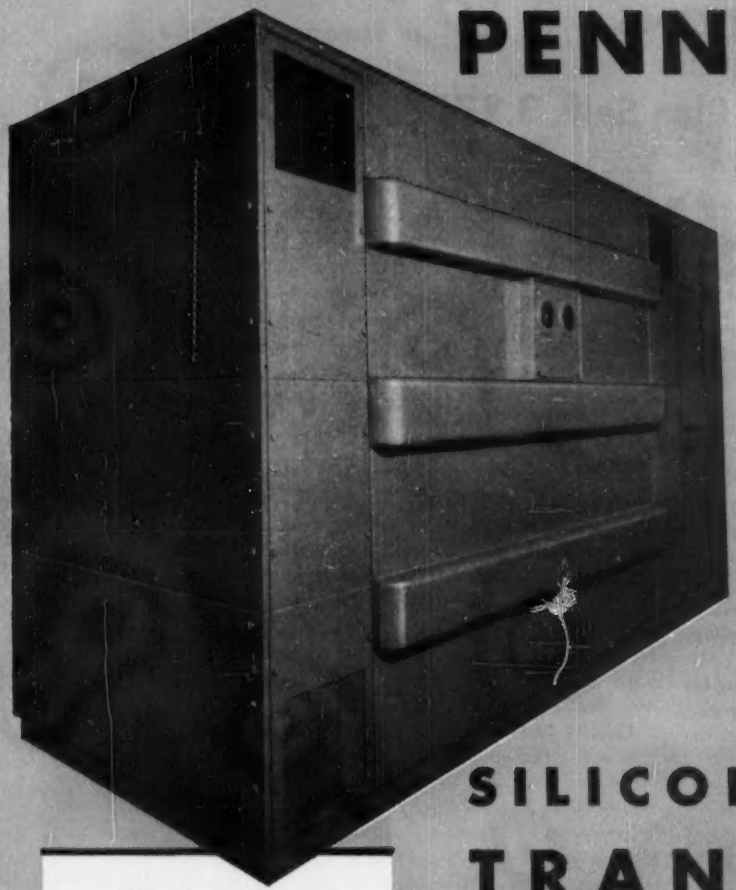
If rigging is adjusted for horizontal suspension on one lift, later reversal of any part of the rig, including the double hook, would require readjustment of the slings to level the load on subsequent lifts. This is obvious with unsymmertical loading of the rig, but is also due to lack of exact symmetry of the double hook around its vertical axis.

Each sling readjustment would take 10 to 30 min, and as much as 6 to 8 times this period per unit, or possibly 4 hr total, if this marking scheme were not applied.

PENNSYLVANIA

suggests you consider

Fire and Explosion resistant



2000 Kva Group 3 Sealed-in Nitrogen Dry Type Transformer. H. V.—2400Δ volts. L. V.—480Δ volts. Three Phase. One of the largest Silicon-Insulated transformers ever built.

SILICONE-INSULATED TRANSFORMERS for Indoor Unit Substations

When planning an indoor unit substation, plan to install the safest substation transformer ever developed — a Pennsylvania Silicone-Insulated, sealed-in-nitrogen 150°C. Rise Dry Type Transformer.

Since oil-filled transformers constitute a fire risk, they cannot be used safely indoors unless expensive vaults and barriers are erected. And though askarel-filled transformers are installed indoors without vaults or fire barriers, they have been known to give off toxic HCl vapors under arcing. This constitutes a hazard to personnel. Therefore, Askarel transformers must be provided with gas absorbers or they must be vented to the outside air.

Pennsylvania Silicone-Insulated Transformers can be installed indoors "as is", without expensive vaults and other costly safety devices because inherently, they are the safest transformers ever developed. But safety is only one of their many advantages, for these "safest" dry type transformers also feature *smaller size, greater overload capacity, decreased cooling time, resistance to dirt and moisture, and minimum requirements for maintenance.*

If you want to know more about the Pennsylvania Silicone-Insulated Transformer — formerly called Class H — see your Pennsylvania representative or write to Pennsylvania Transformer Company, Box 330, Canonsburg, Pennsylvania.

PENNSYLVANIA TRANSFORMER COMPANY

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pt

INDUSTRIAL APPLICATIONS

Power Factor Improvement Plan Sells 3,275 kvar In Capacitors

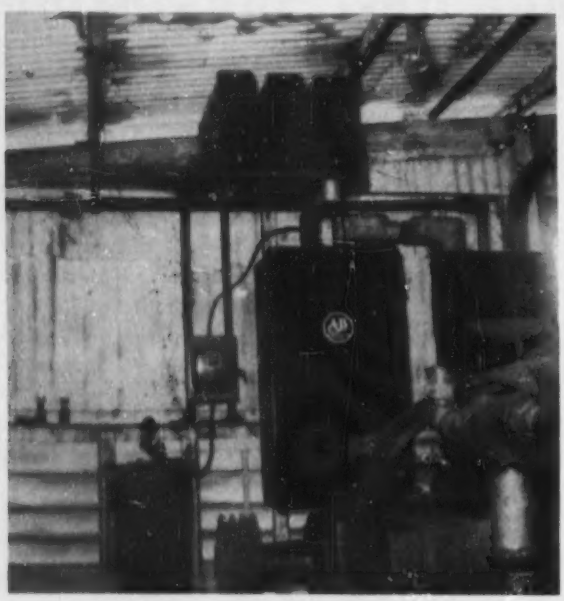
C. D. ANDERSON, Power Sales Engineer, Savannah Electric & Power Co, Savannah, Ga.

A recent power factor improvement program among the industries served by the Savannah Electric and Power Co, resulted in the installation of 3,275 kvar in capacitors in 35 companies. This promotion, launched by the Power Sales Department of the company, raised the power factors of these industrials from an average of 75% to a point well above the 85% minimum of the utility's power factor clause in its Industrial Rate.

Although there has been no monetary value placed on this power factor improvement from the viewpoint of the utility, this 3,275 kvar, installed on the secondary side of the system, not only has released additional capacity, but in some instances has corrected voltage problems in plants served by unregulated feeders. In many cases the savings realized by customers from rate eligibility changes paid for the installations in less than a year. They also benefited greatly from improved distribution capacity, and voltage and reduced electrical losses.

From the very start, it was a selling job. The intangible benefits of a good power factor were the main selling aids along with the 85% minimum power factor clause in the availability statement of the industrial rate.

The power factor in the majority of cases was determined during the peak loading of the plant and charts were left on the recording meters four to six days. From these original checks, the total amount of capacitance needed to correct to approximately 87% lagging was calculated. This was done by using power factor correction tables as found in one of the manufacturer's publications.



SIDE MOUNTED 7½-kvar capacitors are connected to the load side of an overcurrent device of an air compressor induction motor in a steel products plant. A total of 405 kvar in capacitors throughout the plant raised the power factor to 87%—saving $150 monthly

After the total kvar was determined, the customer was notified of the condition at his plant by a personally delivered letter. Preliminary engineering advice was usually given at this time and an off-the-record estimate of the expected cost. The cost was estimated at $30.00 per kvar installed for 230-v installations and $15.00 per kv for 460-v installations. A more concise report was usually submitted to the customer after an on-the-spot check with the plant electrician. It contained a breakdown on the size and number of units needed.

Placement of these suggested units was recommended commensurate with economy and practicability. In all cases, where possible, the capacitors were placed on the load side of the motor overcurrent device. This, of course, was governered by the size of the motor and the length of running time. In cases where there were a good many small motors, or the larger motors had a large diversity, recommendations were made to install the capacitors on the feeders with disconnect means and fusing within the limitations as set forth in the National Electrical Code Article 460, Section 4607, Paragraphs B and C.

Usually two or three months elapsed before an installation was complete. In some cases, delivery of the equipment was poor and usually took some expediting by the Power Sales Engineer. After the capacitors were installed, a second set of charts was made for four to six days as a recheck on the installation. In all cases, the rechecks were satisfactory. This was due to the fact that a safety factor of 2 to 3% was figured on the power factor desired.

Of the industrials checked, excluding laundries, the average power factor found was approximately 75%, with the laundries running 10% less or 65%. This differential was due mainly to the use of centrifugal extractors. These machines were not "clutched" in any way and were driven by V belts which required overmotoring to compensate for high starting torque inherent in this motor application. There were many small problems encountered during the 18 months of this survey, but by the close cooperation of the electrical distributors, contractors and plant engineers, they were solved to the satisfaction of all.

All industrial accounts were checked. There were a total of 80 original checks, and 35 of these needed improvement with a subsequent recheck, making a total of 115 checks. These 35 accounts installed a total of 3,275 kvar. The largest of these installations were Certainteed Products Company with 500 kvar, Steel Products Company with 405 kvar, Southern Cotton Oil Company Mill with 275 kvar, and Rathborne, Hair and Ridgway with 240 kvar.

Some customers were found to have a low power factor but it was not economical to take any corrective measures and their billing was changed to another rate schedule.

It is planned for the future to make periodic and systematic power factor checks of all industrials at intervals of two years. This will make any further improvement of a customer's power factor, because of increased load, of small consequence financially.

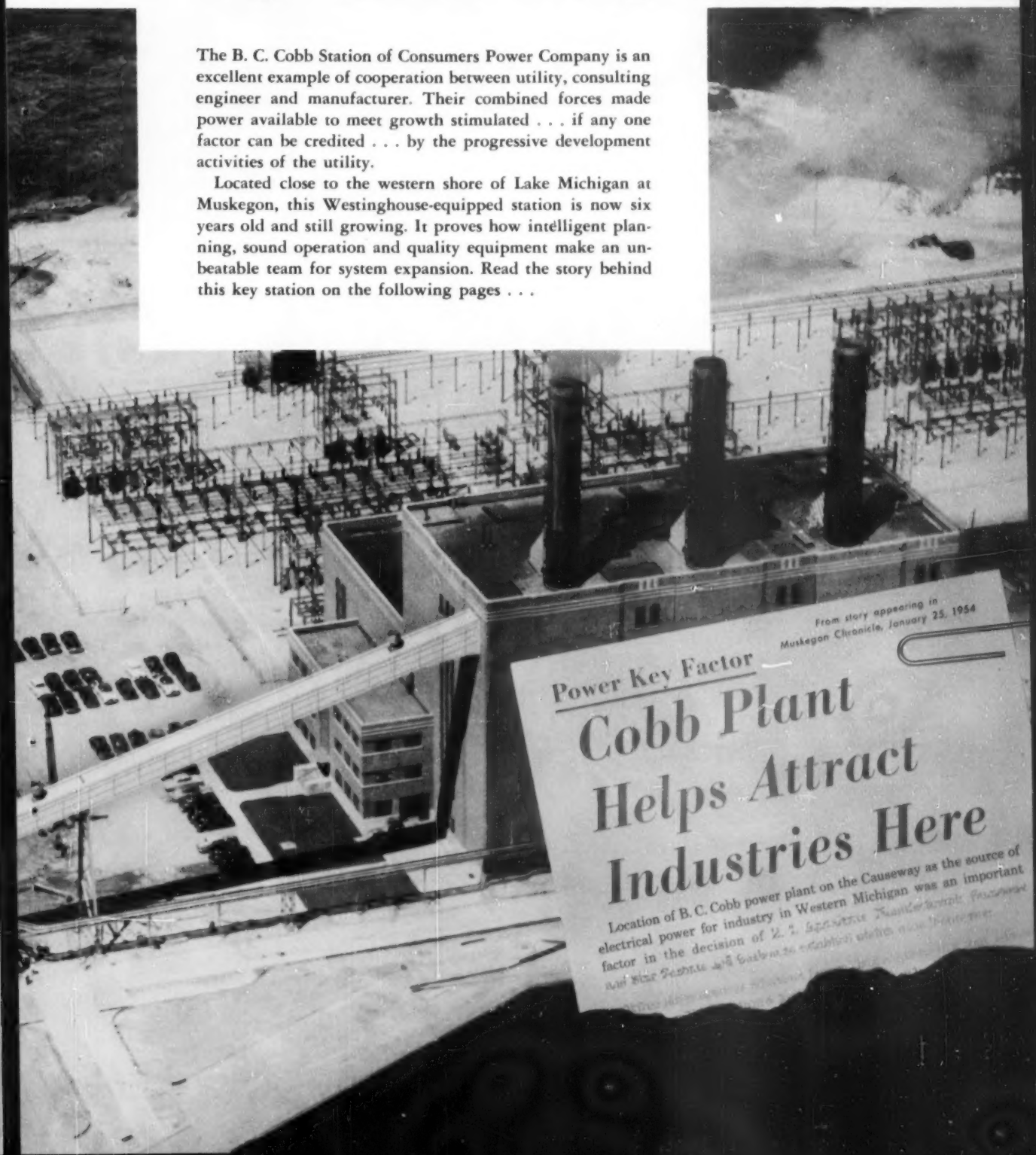
(*More Industrials on page* 103)

CONSUMERS POWER REPORTS:

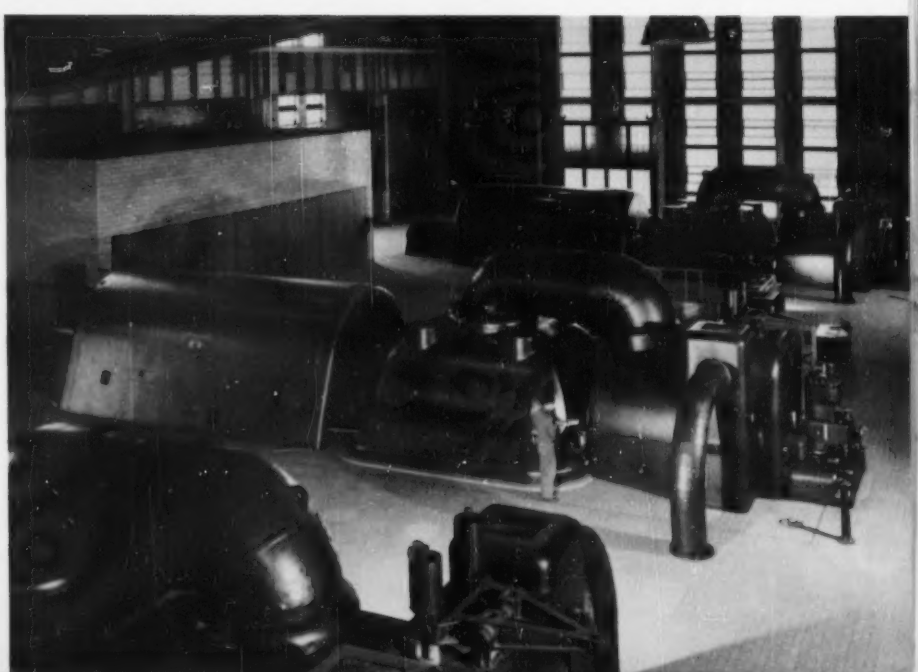
All-Westinghouse station helps outstate Michigan grow

The B. C. Cobb Station of Consumers Power Company is an excellent example of cooperation between utility, consulting engineer and manufacturer. Their combined forces made power available to meet growth stimulated . . . if any one factor can be credited . . . by the progressive development activities of the utility.

Located close to the western shore of Lake Michigan at Muskegon, this Westinghouse-equipped station is now six years old and still growing. It proves how intelligent planning, sound operation and quality equipment make an unbeatable team for system expansion. Read the story behind this key station on the following pages . . .


From story appearing in
Muskegon Chronicle, January 25, 1954
Power Key Factor
Cobb Plant
Helps Attract
Industries Here
Location of B. C. Cobb power plant on the Causeway as the source of
electrical power for industry in Western Michigan was an important
factor in the decision of

J. H. Campbell, vice-president, Consumers Power Co., (center) discusses turbine blading for Unit No. 4 — 156,250 kw — with J. E. Payne, Westinghouse vice-president, and W. S. Bovard, manager of the Jackson, Mich., office of Westinghouse. Cobb Station Units 1, 2 and 3 are shown at right.



Three-way cooperation put Cobb Station on the line on schedule . . . achieved economy in design and operation

The story of the B. C. Cobb plant goes well back into the history of the system, when the site at Muskegon was selected. The postwar potential of western Michigan dictated speed, but in early 1947 maintaining a construction schedule was a problem. Consumers Power and Commonwealth Associates found the answer in one supplier, one responsibility . . . and Westinghouse became the third partner.

W. S. Bovard, Westinghouse sales engineer, and now manager of the Westinghouse office in Jackson, went to work with the full facilities of his corporation. In addition to supplying and coordinating major equipment, Westinghouse followed through on small apparatus as well. The result: Complete standardization, with uniform reliability throughout the plant. Unit No. 1—66,000-kw nameplate, 70,425 guaranteed capability at 1.5″ Hg—went on the line for commercial operation in November, 1948.

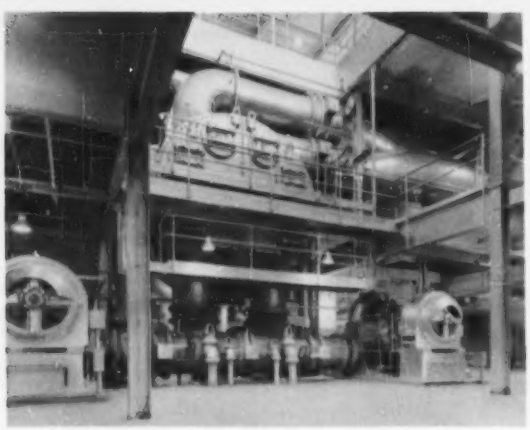
Cost per kilowatt $110.00 Heat rate holds firm

Two factors are largely responsible for this low cost and continued efficiency: Good planning and extensive use of standardized equipment. Cost proved out at $110.00 per guaranteed gross kilowatt, exclusive of substation . . . this in spite of unusual foundation expense which ran close to $5.00 per kw.

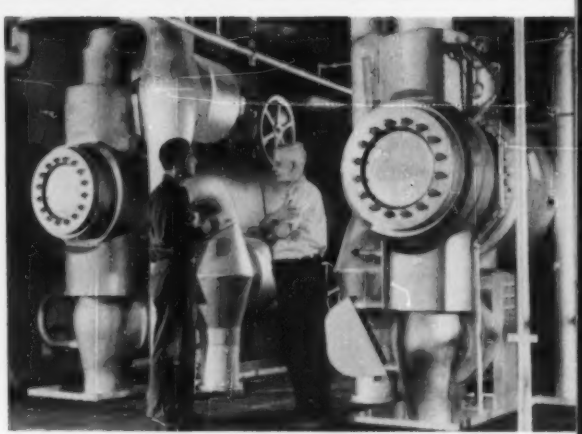
J. H. Foote, president of Commonwealth Associates, states that Cobb Station represents the most advanced design of its period . . . still turns out economical kilowatts in relation to plant investment. The heat rate holds a highly satisfactory average of about 11,300 Btu/net kwh. A total personnel of only 75 men (exclusive of coal-handling personnel) handles the 3-turbine plant on a round-the-clock basis.

YOU CAN BE SURE...IF IT'S Westinghouse

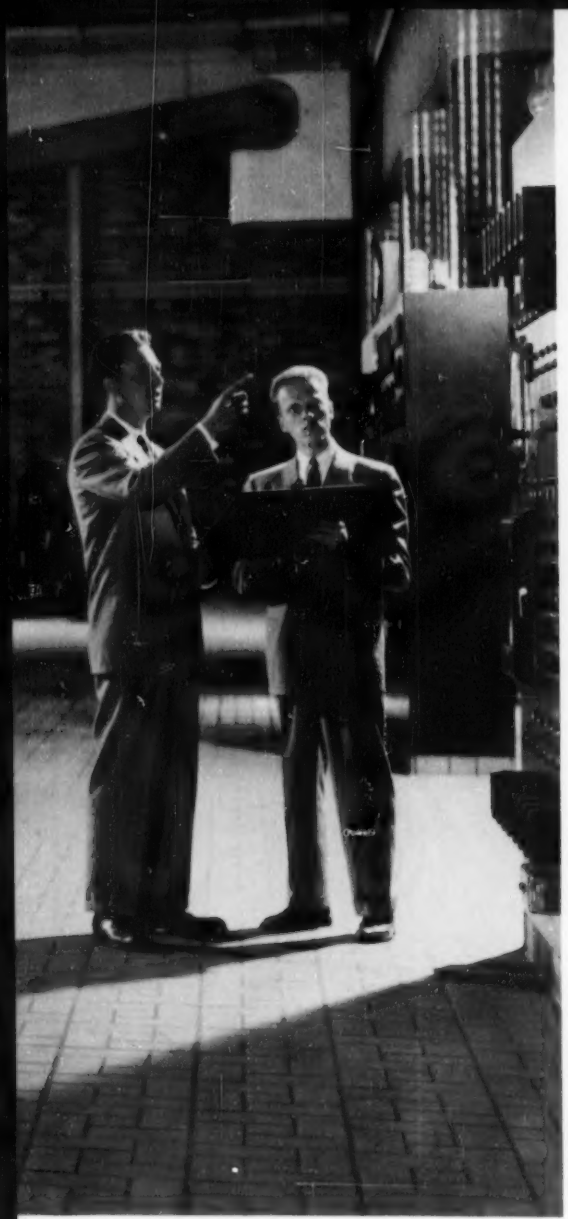
Key men in the three-way cooperation which put Cobb Station on the line on schedule are C. E. Arvidson, vice-president, Consumers Power and J. H. Foote, president, Commonwealth Associates. With W. S. Bovard representing the third member of this successful team, they are discussing how reliable power from Cobb has become a key factor in supplying power for western Michigan.



Westinghouse condenser performance has always been highly satisfactory. Free oxygen in the condensate holds consistently within guarantee values—contributing substantially to over-all plant efficiency. In fact, this performance has become their system criterion.



Clarence Medley, turbine operator, and Dennis Smallegange, mechanical maintenance supervisor, check feedwater heater temperature. There are four heaters: Two low, an intermediate and a high pressure. Mr. Smallegange reports, "No tube replacements or leakage."



The turbine-generators at Cobb have been notable for extremely smooth operation and highly efficient governing. While Plant Superintendent Ernie Palmer (left) was showing Dick Wilson, Westinghouse sales engineer, the operating log, one of the operators volunteered: "It's a pleasure to watch these governors work. They respond promptly and you hardly see them move."

Standardized apparatus

...best of current designs with proved performance, substantial savings

Extensive use of standardized equipment to attain maximum economy and speed construction is typified by the steam apparatus for B. C. Cobb Station. The three Westinghouse turbine-generators in the present station are all 66,000-kw ASME-AIEE Preferred Standard. They were among the very first preferred standards to be installed anywhere, and bore out the advantages of initial cost savings, faster delivery and easier installation.

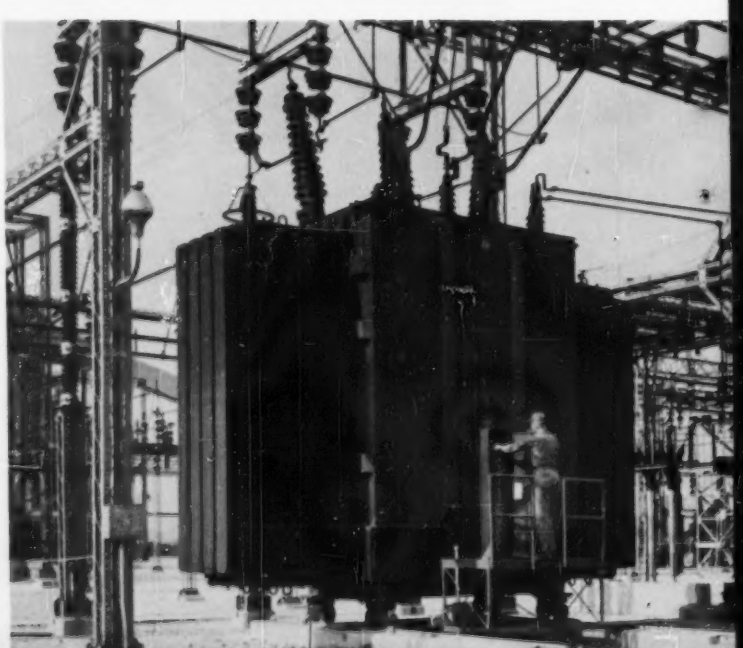
In 1956, still another Westinghouse turbine-generator will be added . . . this one a 156,250-kw guaranteed capability reheat design. With this installation, Cobb Station will have four Westinghouse units, each representing the best design of its day. Already, the three 66,000-kw units have established a fine record of reliability, being given preferred use on the system.

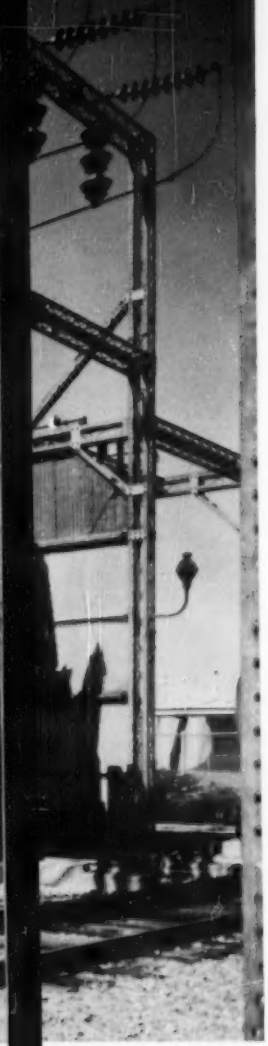
The same record for dependability has been established by the other Westinghouse steam apparatus. Condenser performance has become their system criterion, and the feedwater heater operation parallels the trouble-free operation of the other equipment. Feedwater heaters for Unit No. 4 will be the latest Westinghouse design; the high pressure heaters incorporating the exclusive quadrant head construction.

YOU CAN BE SURE...IF IT'S Westinghouse

At Cobb Station, "Form-Fit" design of the main power transformers allowed adequate space for side-by-side installation with the standardized station power transformers. Above, Dan Potter, electrical maintenance supervisor, and Joe Fordyce, Westinghouse Engineering and Service supervisor, review the performance record of the units, rated 75,000 kva and 6,000 kva.

Francis Geisler, assistant switchboard operator, checks the Inertaire® mechanism of this Westinghouse "Form-Fit" substation transformer, rated 30,000 kva, OA, installed in Cobb Switchyard.





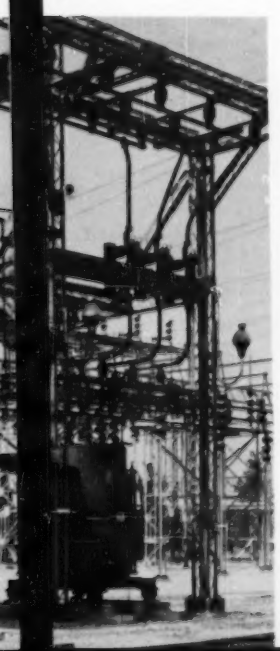
"Form-Fit" power transformers saved space...speeded installation

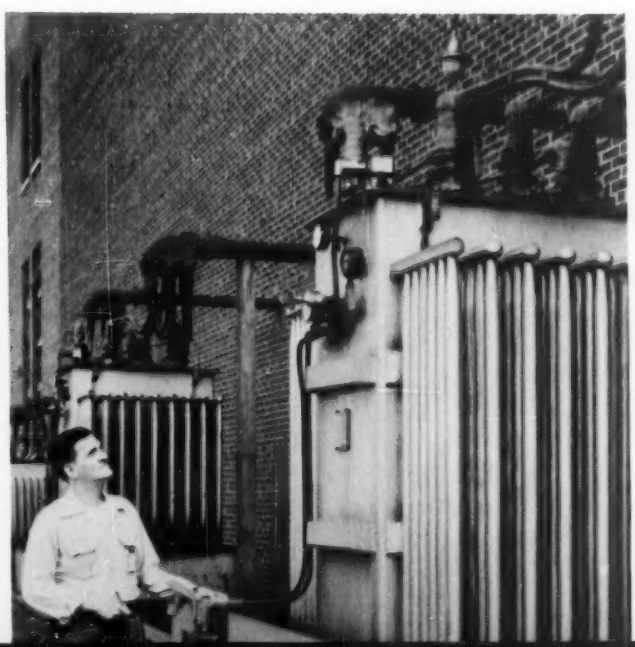
At Cobb Station, this story is legend: "When the first of these transformers came in here on its flatcar with radiators detached, it seemed too small to possibly be the capacity specified."

They referred to the three main power transformers, rated 75,000 kva, FOA. The extremely compact "Form-Fit" design made it possible for them to be delivered upright and, except for detachable radiators and bushings, in one piece. It also made possible installation outside the station wall in direct line with the turbines. Adequate space for installation of 6,000-kva standardized Westinghouse station power transformers was available between the main transformers.

Westinghouse "Form-Fit" power transformers consistently provide superior mechanical, thermal and dielectric properties with greater compactness than any other design. Westinghouse standardized transformers, core-form design, offer reliability with economy. Consumers Power, like many other utilities, has found Westinghouse three-phase power transformers so reliable that stand-by units are not required.

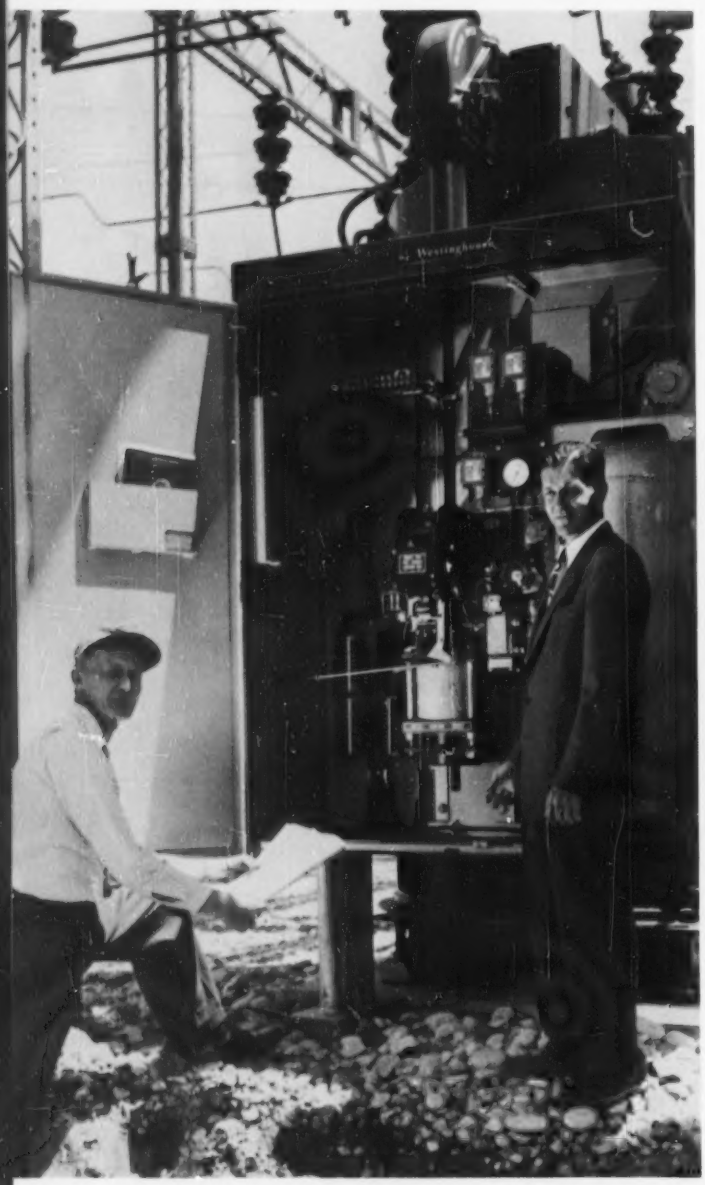
YOU CAN BE **SURE**...IF IT'S
Westinghouse





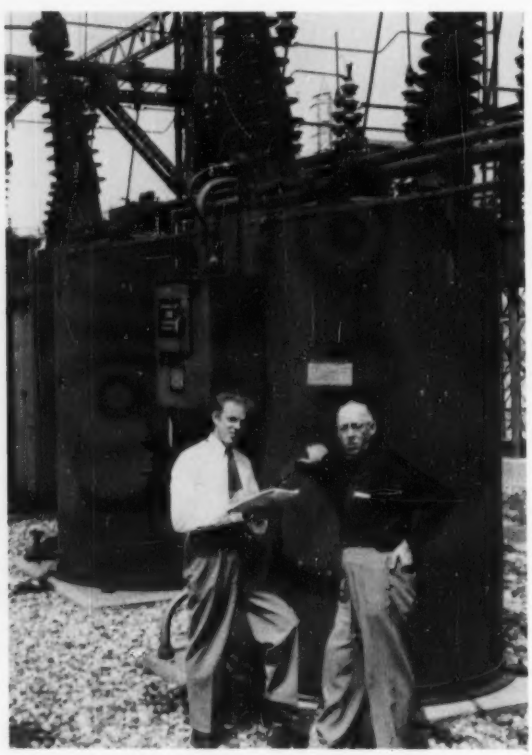
Al Witham, assistant switchboard operator, inspects the Westinghouse "SL" 750-kva power transformers installed on the station roof. One of their own best customers, Cobb Station depends on these transformers to supply power for all 480-volt motors.

Six-year record of "trouble-free" operation proves quality of Westinghouse breakers



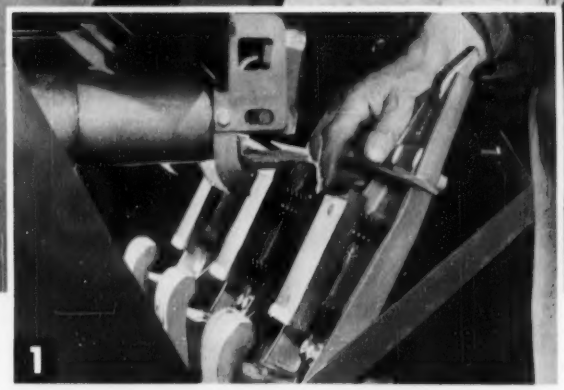
From the large-capacity, 138-kv switchyard breakers, down through the 480-volt, metal-enclosed switchgear, the breakers at Cobb Station have compiled an enviable record of trouble-free operation. In all six years of the station's history, they report only one problem: a bent stud on a contact of the 2400-volt switchgear serving the ash jet pumps . . . after the counter had recorded 18,573 operations! Because the drawout feature of the switchgear made it easy, the contact was quickly replaced. After the stud was straightened, it was returned to stock, good as new.

Dan Potter and Joe Fordyce are checking the diagram of the AA-10 pneumatic mechanism of a GM-5 power breaker rated 138,000 volts, 1200 amps. This breaker protects the transmission line to a new chemical plant. Potter is standing in the area excavated for the foundation of a new bank of Westinghouse GM-5's, to be installed.



Dick Wilson of Westinghouse and Roscoe Munch, shift supervisor, compare notes on the GM-4 breakers, 138 kv, 600 amperes. The consensus: "Once they're properly installed, these breakers are trouble-free pieces of equipment." Time and again that was expressed . . . the trouble-free operation proving quality of equipment better than any test.

YOU CAN BE **SURE**...IF IT'S

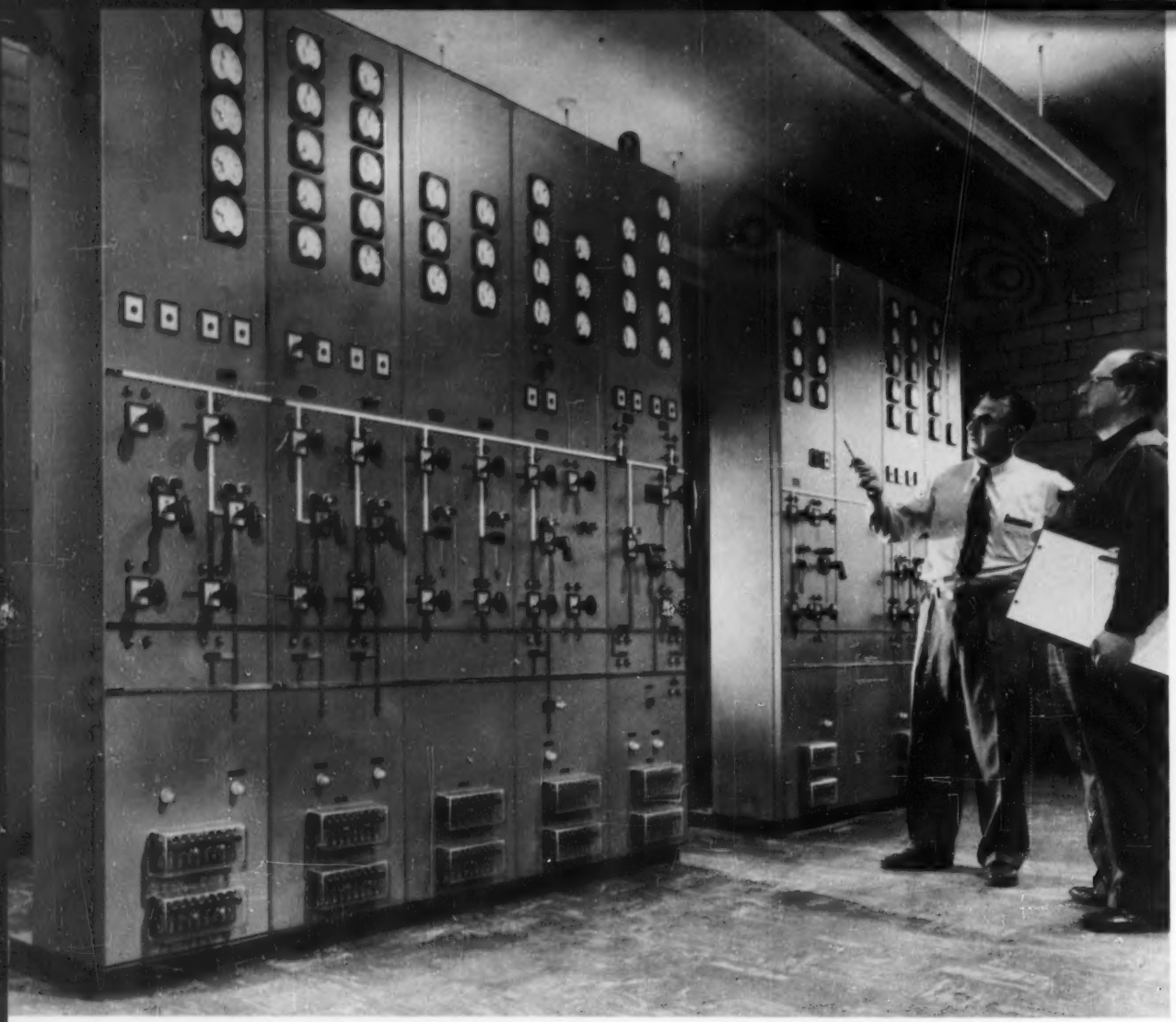


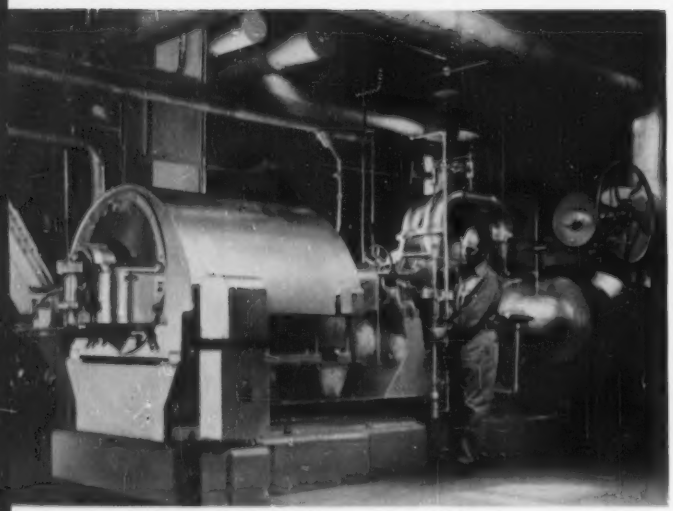
Dan Potter, electrical maintenance supervisor, shows how the drawout feature makes it easy for Gil Conroy to periodically check the 2400-volt breakers. This is the one breaker in the entire station that required service after 6 years and 18,573 operations.

Close-up of the breaker contacts in the 2400-volt switchgear. There are 34 breakers of this class in Cobb Station controlling and protecting the station's heavy electrical auxiliaries . . . with an enviable six-year record of trouble-free operation.

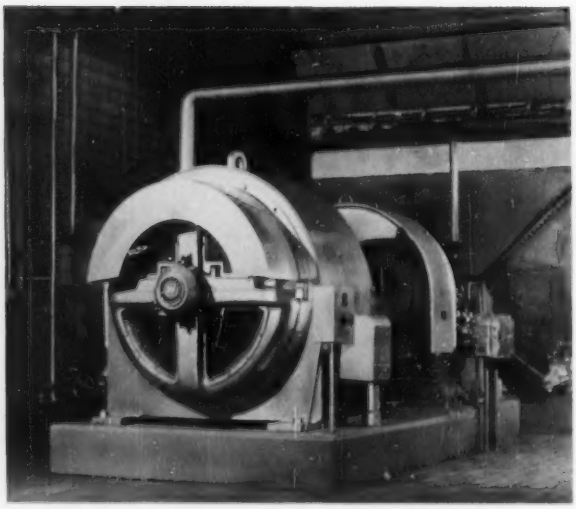
Here's the evidence. The damaged contact, left, had the stud straightened and was returned to stock, just as good as the new contact shown at right. Note the complete absence of pitting, burning or wear.

Westinghouse

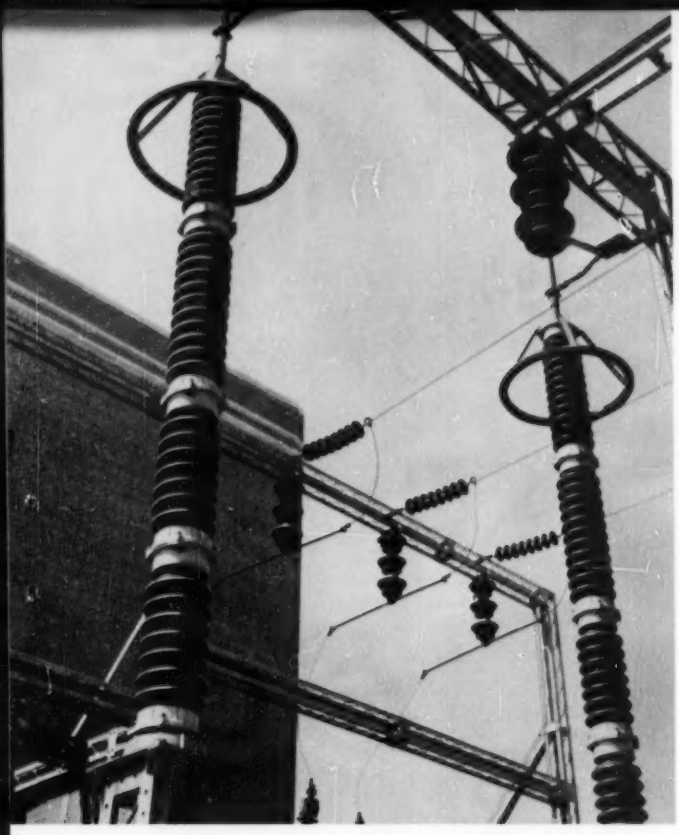




James McCann, assistant boiler operator, makes a routine check of bearing temperature on the Westinghouse 2300-volt, 1000-hp powerhouse motor, which operates one of the boiler feed pumps. All auxiliaries depend on Westinghouse motor drives.

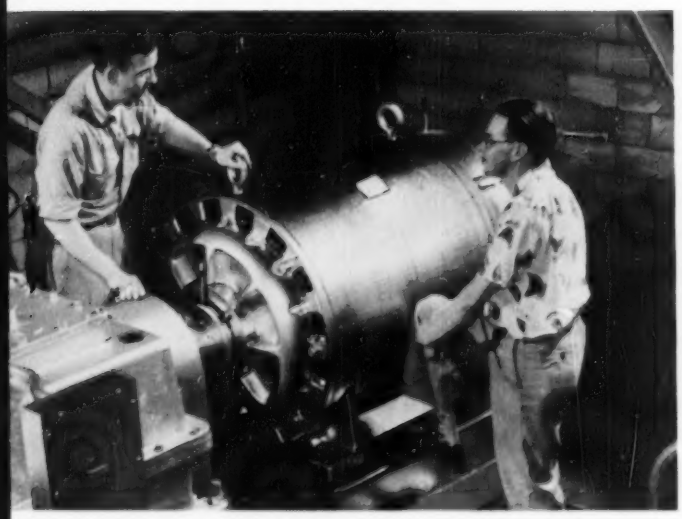


Induced draft drives. These standard 2300-volt, 1000-hp powerhouse motors were designed to operate in high ambient temperatures. This area of the plant averages 120 degrees . . . often gets up to 140 degrees F.



Westinghouse SV arresters. Six years on the line—no trouble whatsoever! How many surges? How large? The protection has been so perfect, there is no way to tell.

Ray Franks, shift supervisor, checks the electrical control panel with Alex Barringer. This installation was one of the first to use the new full-view Type K-24 circular scale instruments. Readings can be made at angles up to 65 degrees and without interference from glare with this widely accepted Westinghouse design.



Douglas J. Mullen with Harry McConnel, shift supervisor, at the 2300-volt, 200-hp induction motor in the coal house. This is an explosion-proof conveyer drive which lifts coal from the base of the pile to the bunkers, eight stories above.

Westinghouse reliability makes Cobb Station a top performer

Cobb Station has achieved its top performance through four prime factors: (1) Good utility—consultant planning; (2) Selection of standardized apparatus; (3) Westinghouse single source responsibility; and (4) Ability of Westinghouse equipment to meet or exceed all specifications.

Time and load growth have been a good test. To say that Cobb Station was put on the line without a "hitch" is unrealistic; but with a team of competent Westinghouse engineers on hand, every problem was handled promptly. The result: All three members of the team: Consumers Power, Commonwealth Associates and Westinghouse are proud of Cobb Station . . . prouder still of its dependable and efficient operation.

This record of Westinghouse apparatus is not unusual. But it does illustrate the extremely broad scope of products, the reliability of equipment and service, and the product engineering assistance which can help every utility in achieving the best possible performance and lowest possible cost in meeting their growing loads.

YOU CAN BE SURE... IF IT'S Westinghouse

Still growing . . . Unit No. 4 scheduled for 1956

The planning of Consumers Power moves well in advance of the growth of outstate Michigan. With the addition of Unit No. 4, a 156,250-kw reheat unit and its 170,000-kva "Form-Fit" transformer, gross guaranteed capability at Cobb Station will be 367,-525 kw—all Westinghouse.

The same cooperation which has made this station successful—utility, consultant and manufacturer—also helps them in their system planning. An Economic Loss Study, made on Westinghouse calculating facilities, is helping Consumers Power improve their operation and provide for automatic system load control.

In the photograph above, Emmett O'Meara, construction superintendent, shows Dick Wilson the technique of using watertight construction, then calculating the natural buoyancy of the plant to reduce the number of piles required for solid footing. Inset shows preliminary drawing of Cobb Station as it will appear when Unit No. 4 is completed.

Westinghouse sales engineers, at your service

Men like Bill Bovard and Dick Wilson, who represent Westinghouse in the Consumers Power territory, are ready to serve you at any time . . . to help solve problems, get better equipment, or improve operations. Behind them are corporate facilities covering every aspect of your business, from fundamental research through manufacturing capability.

Call them at your local Westinghouse office, or write direct to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. CP-1024

YOU CAN BE SURE...IF IT'S

Westinghouse

CURING ROOM is equipped with 5.4 kw of infra-red lamps. They provide constant temperature and humidity which slowly dries the tiles. The result is a uniform, high quality roofing tile

Infrared Replaces Gas for Better Tiles

R. M. PIZZA, Consultant Business Development Dept Utah Power & Light Co, Salt Lake City

Infrared lamps are being used to cure roofing tile at the Salt Lake Bartile Corp, Salt Lake City, Utah. The lamps provide constant temperature humidity in the curing room. This allows the moisture content in the tiles to escape slowly and results in a uniform, high quality product.

The 18 hard-glass 300-w lamps installed in the curing room replace gas-fired heaters which were equipped with blowers. The lamps keep the temperature at 110 F with a relative humidity of about 70. With the gas heaters, it was difficult to control the humidity. Consequently, tiles dried out and often cracked, warped or became brittle.

The curing room measures about 20x40x8½ ft and holds 25 racks of 150 tiles each. Tiles remain in the room for a full day and then are transferred to the outside yard. They are held for about three more days before being delivered. Company officials are pleased with the infra-red drying. They are now planning to enlarge the curing room.

Capacitors Solve Distribution Problem

Correcting power factor to 87% lagging with 405 kvar in capacitors at Steel Products Co, Savannah, Ga., increased production and saved approximately $150 per month in power bills, according to J. C. Cheshire, production superintendent of the company. This plant manufactures trailers and fabricates steel. There is a large welding load, but it is decentralized. The use of 25-hp motor generator sets throughout the sprawling shops created a distribution nightmare for engineers. The mobility of the welders sometimes worked a hardship on plant feeders, especially when concentrated in one area.

This was corrected by the installation on each welder of a 7.5-kvar shunt capacitor unit. For power factor correction in the permanent welding areas, series capacitors were banked. More welders can now concentrate on one job if needed for a rush order —resulting in faster production. C. D. Anderson, Power Sales Engineer, Savannah Electric & Power Co, Savannah, Ga.

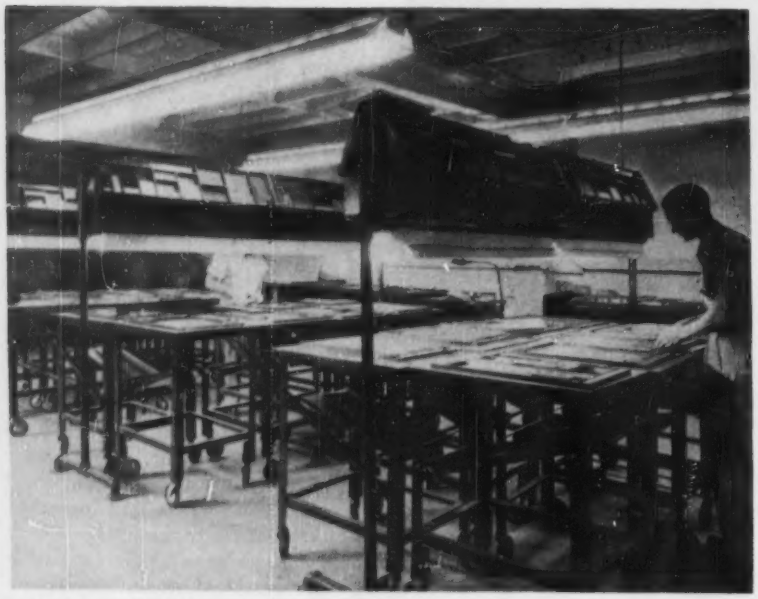
INDUSTRIAL BRIEFS

Space heating a freight office with electric fin type strip heaters at the Erie Railroad Co, Hawley, Pa., eliminated the need for hand-firing a coal stove during nights and weekends when the office was closed. Approximately 5 kw in the space heaters were installed in the wash room and at other strategic locations to prevent damage from freezing. Charlie Miller, Industrial Power Representative, Pennsylvania Power & Light Co, Wilkesbarre, Pa.

Heating degreaser for sheet metal products at H. P. Products Co, Louisville, Ohio, with electric immersion units increases safety and reduces operating cost over gas fuel. Customer considered using gas for heating the perchlorethylene degreaser with a water ring installed to prevent boil-over. Since degreaser is frequently unattended for long periods, thermostatically controlled electric immersion elements were chosen for reason of safety and economy. T. C. Streb, Commercial Sales Representative, The Ohio Power Co, Canton, Ohio.

Heating platens for six hydraulic presses with electric elements at Aircraft Marine Products, Inc, Elizabethtown, Pa., maintains accurate temperature control within 3 F. Processing time is reduced 15% with aid of shields on three sides of presses to prevent loss of heat. Temperature control of original installation was not possible within required 5 F limits, so platens were drilled and cartridge-type thermostats installed near the centers. Total platen load is 40 kw. Clyde Oberholzer, Industrial Power Representative, Pennsylvania Power & Light Co, Lancaster, Pa.

Fan-type wall heaters provide adequate heat for the office and temporary living quarters of Julian N. Bills, operator of the Motor-Vu Theatre, Bountiful, Utah. The heaters, with 6 kw of total connected load at 220 v, keep the working-living area comfortable during the theatre's operating months when Bills lives on the premises. Richard Pizza, Consultant, Business Development Dept, Utah Power & Light Co, Salt Lake City.



COMPOSING STONES have 175 ft-c provided by four lamps under each rack. With 60 ft-c general lighting above, sharp eye-straining contrast and brightness ratios are reduced.

Print Shop Brightens, So Do Employees

L. M. KELLEY, Lighting Consultant, Southern California Edison Co, Lancaster, Calif.

Efficiency has been increased and employee morale improved with installation of a new shop lighting system at the Antelope Valley Ledger-Gazette in Lancaster, Calif.

Eye strain, common in print shops, is no more. The new system provides high intensity illumination over the composing stones plus sufficient overall shop lighting to keep sharp contrasts to a minimum. It is working out so well, in fact, that it has stepped up the interest of other local business firms in better lighting.

Small presses and linotype machines are located in the front of the shop, with composing stones and type racks in the rear. Exposed rafters with steel trusses run across the width of the ceiling at a 10 ft max height. Rafters and trusses are painted white, the walls are pastel green, and the concrete floor is unpainted. Presses and other equipment are gray.

General illumination of 55 ft-c over the presses is provided by four continuous rows of two-lamp, 96-in., 430 ma slimline industrial fixtures. They are mounted at a height of 10 ft on 12-ft centers. High contrasts and brightness ratios are minimized by using fixtures that provide upward components and have egg crate louvers.

The same type lamp also is used for general lighting over the composing stones except that they are arranged in three continuous rows on 10-ft centers to give 60 ft-c illumination. A minimum of 65 ft-c is maintained on all shop working surfaces.

Directly above the composing stones and type setting tables (where some of the most eye-taxing work is done) single-lamp, 48-in. fluorescent strips with asymmetric reflectors yield illumination of 175 ft-c. Chosen because they are easy to install and maintain, they are mounted in pairs of two on the bottoms of overhead type cases. This puts the light source at two ft above the stones and a comfortable 1½ ft below eye level.

Farm Calendar Planned

Inter-Industry Farm Electric Utilization Council is working up a promotional calendar for farm equipment similar in purpose to Edison Electric Institute's home appliance calendar. It will be used by state organizations to set up sales plans.

Cool Schools?

Growing Phoenix may air condition its classrooms, run schools on year-round basis

Faced with overcrowded schools, growing Phoenix, Ariz is considering a plan to air condition its class rooms and place them on a year-round operating basis.

Instead of two semesters, there would be four quarters with attendance mandatory during three. Under the four-quarter school year, educators believe they can handle 25% more students in existing facilities and save $500,000 a year, even though to cool the schools would cost an estimated $3.5 million.

"We have 12,000 students in regular day class now," said one director. "With 25% more time per year we would be able to accommodate 3,000 additional. A high school for 1,500 students will cost $2 million, or $4-million for 3,000 students. Even if cooling costs are $3.5 million, the district could care for the same number of children and save $500,000."

S & S Shorts

League, Bank Stage Wiring Show

Electric Association of Chicago and a local bank got together recently to put on a three-week-long adequate wiring show. Films, exhibits and free wiring advice were offered visitors to the show held in offices of Chicago Federal Savings & Loan Association.

Another Loadbuilder?

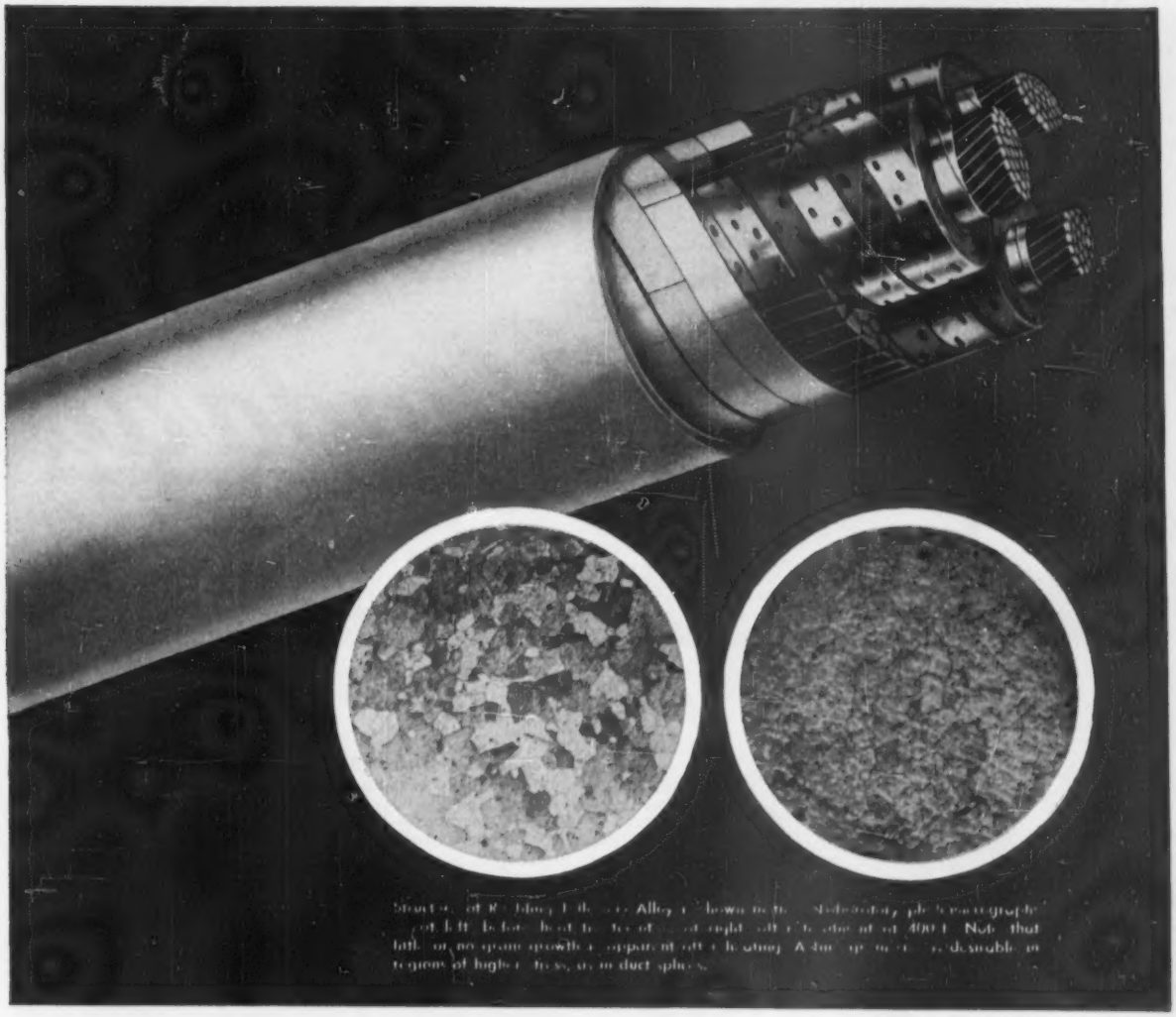
Is the public growing more aware that automatic refrigeration has a place in offices and in living rooms, bedrooms, etc. of homes? Servel, Inc says it is and points to recent sharply increased sales of its electric refrigerettes as proof.

Shorties . . .

Retail discount outlets now do a business of about $25 billion a year —18% of the total retail volume, reports the Chamber of Commerce of the United States . . . Along with its

(*Continued on page* 108)

ROEBLING TELLURIUM ALLOY LEAD SHEATH ASSURES FAR LONGER CABLE LIFE



BIGGER LOAD REQUIREMENTS! Higher temperatures! Increased movement of cable during load cycles! Today's best answer to each of these conditions is Roebling Paper Insulated Cable with Tellurium Alloy Lead Sheath*—the Roebling lead alloy that has completely superior resistance to fatigue.

In addition, Tellurium Alloy Lead Sheathed Cable has a lower long-time creep rate...high bursting strength...remarkable stability under heat application as in duct splicing and wiping. And on top of that, it eliminates need for frequent stop joints or reinforced lead sheath...does not require generous expansion bends or large manholes.

Write us now for full information. John A. Roebling's Sons Corporation, Dept. 707, Trenton 2, New Jersey.

*Licensed under Patent 2588095 March 4, 1952 and App. No. 308710, Sept. 9, 1952.

ROEBLING CF&I

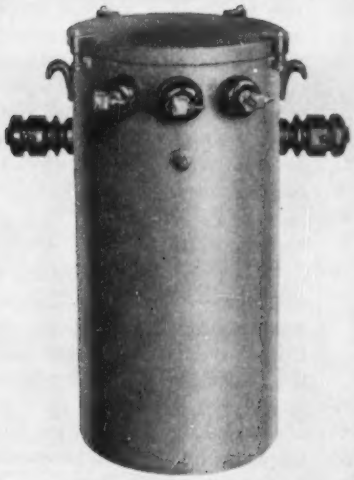
SUBSIDIARY OF THE COLORADO FUEL AND IRON CORPORATION

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13235 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1930 E. 2ND ST. • PHILADELPHIA, 330 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

● If transformer failure keeps your linemen busy removing distribution transformers and installing new ones, then it's time to investigate Standard Transformers as a solution to your problem. Once a Standard Distribution Transformer is installed on a line, it's there to stay . . . silently channeling current to your customers.

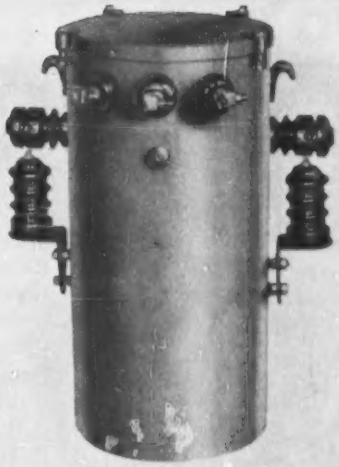
What makes Standard Distribution Transformers such dependable "watch dogs"? Close examination discloses sound, basic construction in full accordance with ASA and REA standards. Outstanding features set them apart from others as an indispensable and integral part of your distribution system. Covers are moisture-proofed with Neoprene gaskets which prevent oil leakage. They can be easily and quickly removed, allowing immediate access to vital parts. A rugged, copper-bearing steel tank houses the low-loss core assembly of non-aging, varnish-coated, silicon steel sheets. Specially designed core clamps hold core rigidly in place assuring quiet, trouble-free operation. These, plus numerous other construction features, demonstrate Standard Transformers to be helpful in solving your excessive maintenance problem.

Naturally, you want more information concerning Standard Distribution Transformers than that which we have presented in these limited words. Your nearby Standard Transformer representative has answers to your questions. Call him. Let him show you how Standard Distribution Transformers can help you maintain the excellent service your customers deserve.

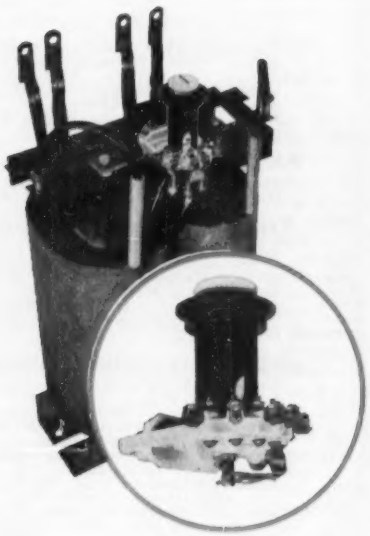


← Type A. OISC Conventional Distribution Transformer, 15 KVA, single phase, 60 cycle, with side wall mounted high voltage bushings. Standard construction for voltages 5 KV and sizes through 100 KVA.

→ Type CSP. OISC Distribution Transformer, 15 KVA, single phase, 60 cycle, with primary lightning arresters, internal fuses, low voltage circuit breaker and side wall mounted high voltage bushings. Standard construction for voltages 5 KV and less and sizes through 100 KVA.



TRANSFORMERS ARE A
YOUR DISTRIBUTION SYSTEM

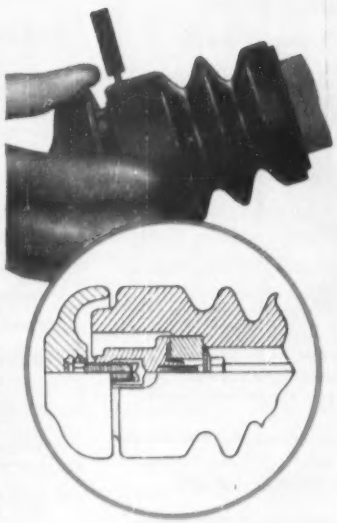


NEW TANK WALL BUSHINGS →

New bushings permit "flick-of-the-wrist" line insertion without tools. No live parts are exposed. Terminal compression stud keeps easy-to-grip, insulated porcelain cap from falling off when unscrewed to receive primary leads. Cables can be brought in from either side and held securely by pressure from the clamping shoe. Makes for faster, safer, easier installations.

←TAP CHANGER SWITCH

Standard's new Tap Changer Switch embodies a contact-making assembly with a brass wheel for positive contact. Normal settings are with 4-tap voltage section. 2½% taps within 10% range of normal rating. Standard supplies transformers with 4 taps above or below, or half above and half below as specified by the customer. This is available at no extra cost to you. Contact-making points are submerged in oil with the handle well above oil level.



Standard

Trade Mark ®

THE STANDARD TRANSFORMER COMPANY

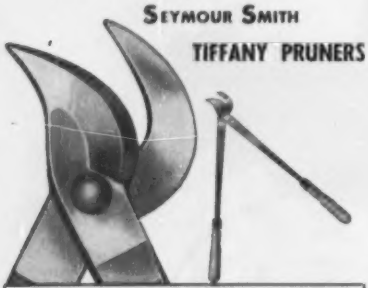
WARREN, OHIO
REPRESENTATIVES IN PRINCIPAL CITIES

Illustrated above is No. 11 Tree Pruner with center cut action by tempered steel blade that easily handles 1" branches. Head is reinforced malleable iron. Spruce poles with telescoping aluminum joints. For heavier work No. 12-18, capacity 1½". Also Pole Saws.

for clearing brush...

SEYMOUR SMITH

TIFFANY PRUNERS



Hand forged throughout. Fast and easy double cut action with thin blades shaped to "draw in." Improved bolt and nut joint, through handle and riveted grip fastening.

FAST-CUTTING SAWS

Blades of Swedish charcoal steel. Large, deep teeth with heavy set to prevent binding. Hand and Pole models for all work up to chain sawing.

Quality Tools
SEYMOUR SMITH
Since 1850

Send for FREE literature
Seymour Smith & Son, Inc.
2412 Main St.,
Oakville, Conn.

S & S Shorts

(*Continued from page* 104)

bills, Long Island Lighting Co is sending stuffers telling customers the dangers and inconveniences of inadequate wiring. Electric Institute of Washington has wiring booklet available for distribution through electric contractors and appliance dealers . . . Sales of home laundry appliances are now picking up again after a slump in the first eight months of '54, reports W. H. Reeve, president of the American Home Laundry Manufacturers Association.

Personalized Disposer Sales

Door to door demonstrations to sell food waste disposers are being urged by Hotpoint Co in new "Pick Up & Go" sales plan. Using kit supplied by the company, salesman leaves waxed garbage bag on prospect's door with printed request to save some food waste. Next day he makes call, carries portable disposer into kitchen, grinds up the garbage and starts his sales pitch. Each prospect is given small gift for cooperating.

FP&L Sales Soar

Florida Power & Light Co is selling appliances this year at a substantial rate higher than national average of manufacturers' sales. For example, in the first eight months FP&L reports clothes dryer sales up 119% over the same months in 1953, while manufacturers are down 12.9%; automatic bed coverings are up 211% while manufacturers are down 24.7%.

New Booklets:

"How to Get Better Feed and Better Prices for Your Grain," eight-page promotional folder published by the Crop Dryer Manufacturers Association. Available at 6¢ per copy in lots of 1,000 or more or 7¢ per copy for less than 1,000 from Frank J. Zink, Secretary, Crop Dryer Manufacturers Association, 4300 Board of Trade Building, Chicago 4, Ill.

Official 1955 NARDA Kitchen Appliance and Home Laundry Blue Books. Prices: $5 per copy, $7 for pair. Order from National Appliance Trade-In Guide Co, 2132 Fordem Ave., Madison 1, Wis.

Meetings Calendar

(*Continued from page* 51)

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

High Frequency Measurement Conference, Hotel Statler, Washington, D. C., Jan. 17-19; Winter General Meeting, Hotel Statler, New York, Jan. 31-Feb. 4; Utilization of Aluminum Conference, William Penn Hotel, Pittsburgh, March 15-17; Southern District No. 4, St. Petersburg, Fla., April 13-15; Middle Eastern District No. 2, Columbus, May 4-6; Summer General Meeting, New Ocean House, Swampscott, Mass., June 27-July 1; Fall General Meeting, Morrison Hotel, Chicago, Oct. 3-7, 1955.

***EDISON ELECTRIC INSTITUTE**

Industrial Relations Committee, EEI Headquarters, New York, Jan. 20; Power and Heating Committee, Atlanta Biltmore Hotel, Atlanta, Ga., Jan. 31-Feb. 1; Prime Movers Committee, Grand Hotel, Mobile, Ala., Jan. 31-Feb. 1; Home Service Committee, Washington, D. C., Feb. 4-5; Accident Prevention Committee, Shoreham Hotel, Washington, D. C., Feb. 9-10; Transmission and Distribution Committee, Shoreham Hotel, Washington, D. C., Feb. 10-11; Industrial Relations Committee in conjunction with AGA at AMA Mid-Winter Personnel Conference, Palmer House, Chicago, Feb. 14; Electrical Equipment Committee, Deshler Hilton Hotel, Columbus, Ohio, Feb. 14-15; Commercial Electric Space Heating and Air Conditioning Committee, St. Louis, Feb. 17-18; Residential Promotion Committee, New York, Feb. 17-18; Accounting Conference, Planning, Edgewater Beach Hotel, Chicago, Feb. 17-18; 1st Street Tree and Utility Conference, co-sponsored with EEI Transmission and Distribution Committee and Street Lighting Committee of Illuminating Engineering Society, Wade Park Manor, Cleveland, March 3-5; Industrial Relations Committee, EEI Headquarters, New York, March 17; Sales Conference, Edgewater Beach Hotel, Chicago, March 28-31; Annual Convention, Statler-Biltmore Hotels, Los Angeles, June 13-16; Industrial Relations Committee, Annual Round Table Conference, Drake Hotel, Chicago, Sept. 19-21, 1955.

DOBLE ENGINEERING CONFERENCE

22nd Annual Meeting, Sheraton Plaza Hotel, Boston, Jan. 24-28, 1955.

***CANADIAN ELECTRICAL ASSOCIATION**

Eastern Zone, All Divisions, Sheraton-Brock Hotel, Niagara Falls, Ont., Jan. 25-28; Western Zone, All Divisions, Bessborough Hotel, Saskatoon, Sask., March 7-9; Annual Convention, Hotel Vancouver, Vancouver, B. C., June 27-29, 1955.

PACIFIC COAST ELECTRICAL ASSOCIATION

Business Development Section, Hotel California, Fresno, Calif., Jan. 27-28; Conference on Electronic Integrated Data Processing, Hotel Statler, Los Angeles, Feb. 23-24; Engineering and Operating Section Conference, Hotel Huntington, Pasadena, Calif., March 7-8; Joint Conference with Pacific Coast Gas Association, Administrative Services and Accounting Section, Jokane Inn, Phoenix, Ariz., April 7-8; Hawaiian Section Conference, Honolulu, Nov. 9-10, 1955.

MISSOURI VALLEY ELECTRIC ASSOCIATION

Industrial and Commercial Sales Conference, President Hotel, Kansas City, Mo., Feb. 3-4; Engineering Conference, President Hotel, Kansas City, Mo., March 23-25, 1955.

NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

Annual Meeting, Convention Hall, Atlantic City, N. J., Feb. 14-17, 1955.

PENNSYLVANIA ELECTRIC ASSOCIATION

Winter Meeting, Relay Committee, Hotel Roosevelt, Pittsburgh, Feb. 15-16; Winter Meeting, Electrical Equipment

Committee, Benjamin Franklin Hotel, Philadelphia, Feb. 17-18; Systems Operation Committee, Abraham Lincoln Hotel, Reading, Pa., Feb. 24-25, 1955.

NATIONAL ADEQUATE WIRING BUREAU

11th Annual Conference, La Salle Hotel, Chicago, Feb. 24-25, 1955.

SOUTHERN SAFETY CONFERENCE-EXPOSITION

Jung Hotel, New Orleans, La., Feb. 27-March 1, 1955.

ROCKY MOUNTAIN ELECTRICAL LEAGUE

Electric Meter Institute, University of Denver, Denver, Colo., March, 1955; Annual Spring Conference, Shirley-Savoy Hotel, Denver, Colo., April 17-19; Fall Convention, Grand Teton Lodge, Jackson, Wyo., Sept. 11-14, 1955.

NORTH CENTRAL ELECTRIC ASSOCIATION

Sales Committee Meeting, Radisson Hotel, Minneapolis, Minn., March 6-9, 1955.

NATIONAL ASSOCIATION OF CORROSION ENGINEERS

Annual Convention, Palmer House, Chicago, March 7-11, 1955.

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

Edgewater Beach Hotel, Chicago, March 13-18, 1955.

SOUTHEASTERN ELECTRIC EXCHANGE

Annual Meeting, Boca-Raton Hotel and Club, Boca Raton, Fla., March 21-23, 1955; Engineering and Operating Section, Roosevelt Hotel, New Orleans, La., April 7-8, 1955.

OKLAHOMA UTILITIES ASSOCIATION

Annual Convention, Mayo Hotel, Tulsa, Okla., March 24-25, 1955.

CONTROLLERS INSTITUTE OF AMERICA

Southern Conference, Mayo Hotel, Tulsa, Okla., March 25-26; Eastern Conference, Royal York Hotel, Toronto, Ont., April 28-30, 1955.

AMERICAN POWER CONFERENCE

17th Annual Meeting, Sherman Hotel, Chicago, March 30-31, April 1, 1955.

ILLUMINATING ENGINEERING SOCIETY

Southern Regional Conference, Ft. Harrison Hotel, Clearwater, Fla., March 31-April 1; Southwestern Regional Conference, Gunter Hotel, San Antonio, Tex, April 3-5; Southern Pacific Coast Regional Conference, Statler Hotel, Los Angeles, April 14-15; Pacific Northwest Regional Conference, Harrison Hot Springs Hotel, Harrison Lake, B. C., April 25-26, 1955.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Spring Meeting, Lord Baltimore and Southern Hotels, Baltimore, Md., April 18-21, 1955.

NATIONAL TELEMETERING CONFERENCE-EXHIBIT

Sponsored by Institute of Radio Engineers, American Institute of Electrical Engineers, Institute of Aeronautical Sciences, Instrument Society of America, Morrison Hotel, Chicago, May 18-20, 1955.

AMERICAN SOCIETY FOR TESTING MATERIALS

Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., June 26-July 1, 1955.

PRODUCTION ENGINEERING SHOW

Navy Pier, Chicago, Sept. 6-17, 1955.

***INSTRUMENT SOCIETY OF AMERICA**

10th Annual Conference-Exhibit, Shrine Exposition Hall and Auditorium, Los Angeles, Sept. 12-16, 1955.

INTERNATIONAL ASSOCIATION OF ELECTRICAL LEAGUES

Annual Convention, Toronto, Ont., Oct. 5-8, 1955.

* Additions this week.

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BERMICO®

LIFETIME CONDUIT

For *real* service—prompt, efficient service—specify Bermico. Many Westinghouse Electric Supply Company offices carry, for immediate shipment, large, well-balanced stocks of all sizes, together with fittings for any situation you may encounter in installing underground ducts.

With Bermico Lifetime Conduit you get the greatest possible protection for your cable—at low cost. It means fewer outages, uninterrupted service for your customers, less expense for you.

Made from sturdy wood fibre, impregnated with pitch, Bermico is *completely uniform* from end to end. It is light, tight, strong, acid-resistant, with *uniformly smooth* bore. For best protection for your cable specify Bermico.

Distributed by WESTINGHOUSE Electric Supply Company

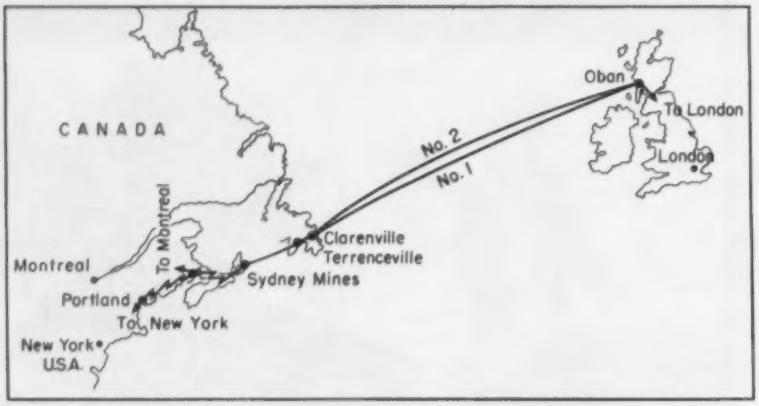
Offices in principal cities

BROWN COMPANY

Berlin, New Hampshire

GENERAL SALES OFFICE: 150 CAUSEWAY STREET, BOSTON 14, MASS.

SOLKA AND CELLATE PULPS • SOLKA-FLOC • NIBROC PAPERS • NIBROC TOWELS • NIBROC KOWTOWLS • NIBROC TOILET TISSUE • BERMICO SEWER PIPE AND CONDUIT • ONCO INSOLES CHEMICALS



First Transatlantic Telephone Cable To Link U.S., Canada, U.K. in 1956

The first transatlantic telephone system, linking the United Kingdom, Canada, and the United States, is scheduled for completion in 1956, and present plans contemplate its commercial operation by the end of that year. This $36-million job exceeds anything hitherto attempted in the field of telephony and involves two unidirectional cables on the main crossing, each about 2,300 statute miles long, with terminals at Clarenville, Newfoundland, and Oban, Scotland.

This system will provide 35 transatlantic telephone circuits and 60 between Newfoundland and Nova Scotia. It was made possible by the development of repeaters with long-life vacuum tubes and capable of sustaining oceanic pressures when submerged. There will be 52 of these repeaters in each of the two cables connecting Newfoundland and Scotland. These repeaters are flexible and structurally like the cables, so that they can be passed over the drum and sheaves of the cable ship without damage. Power for the repeaters will be supplied from the shore ends at about 3.9 to 4.7 kv dc.

The cable will consist of a solid dielectric co-axial structure covered with jute and armor. Overall diameter for sections for 700-fathom depths is 1.21 in. Repeaters are 150-ft long, including tapering tails between input and output sections, and have a diameter about twice that of the cable. Tests have indicated a minimum undisturbed service life of 20 years for the repeaters.

American Telephone & Telegraph Co, the British Post Office, and the Canadian Overseas Telecommunication Corp are cooperating in the project. Simplex Wire & Cable Co, Cambridge, Mass, expects to begin manufacture of 200 miles of the transatlantic cable early in 1955 at its plant in Newington, N. H. The rest of the cable will be manufactured by English firms. The repeaters will be made by Western Electric Co, AT&T subsidiary.

Plant to Develop Metals Is Nearing Completion

The multi-million-dollar Westinghouse Electric Corp plant at Blairsville, Pa., is expected to be completed in 1955. It will develop and pilot produce new metal alloys and castings.

The 480-ft-long building will have five manufacturing aisles and an office area across the front of the building. It will provide facilities for the basic metal-working processes of melting, forging, hot-rolling, cold-rolling, conditioning, pickling, and heat-treating, and in addition will be equipped for such newer foundry techniques as investment casting and shell-mold casting. Powdered metal parts will also be manufactured.

Alkanex Permits Motor Ratings to be Increased

A thin-film, heat-resistant wire insulation has properties that allow engineers to upgrade the horsepower ratings of motors without increasing their size. Known as Alkanex, this thermosetting organic resin was developed in General Electric's Research Laboratory, Schenectady, N. Y.

With the advent of Alkanex insulation, the limiting temperature for long life is reported to be raised to at least 300 F, which will include 90 to 95% of all motors. For example, a 20-hp motor may be upgraded to 25-hp or more.

This new insulation may be applied by standard enameling equipment. It is said to possess abrasion and solvent resistance and resist flow at high temperatures. In experiments the coated wire has been pounded flat without breaking the organic film, and baked at 300 F for more than six months without deterioration or loss of insulating strength.

General Cable to Get Aluminum Sheath Press

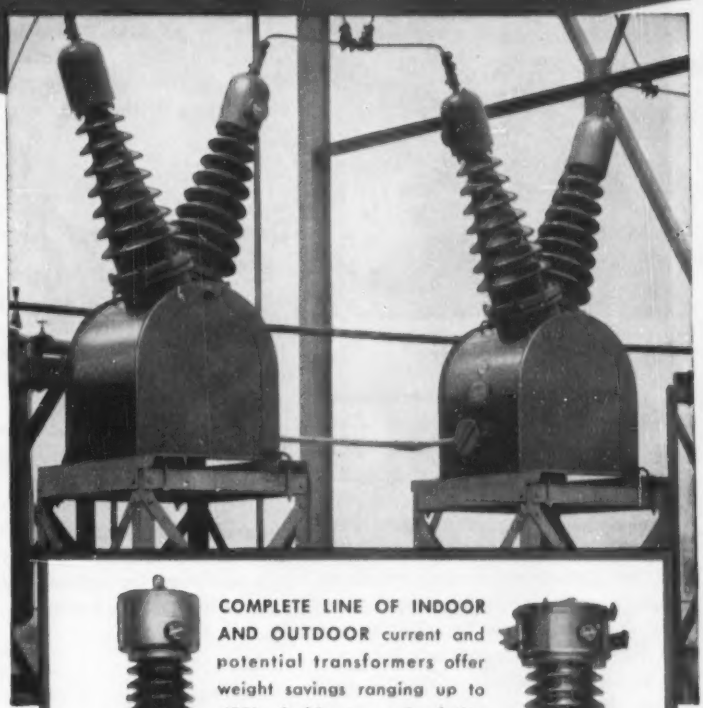
Construction of the first press in the United States for the production of direct-extruded aluminum-sheathed cables is expected to be completed in February, 1955, for General Cable Corp (EW, July 19, 1954, p. 59). Irving T. Bennett, chairman of the board and chief executive officer, and J. R. MacDonald, president, made the announcement after receiving a report from Oscar G. Garner, the company's vice president in charge of plant engineering, who recently returned from a visit to the press builder.

The new press by Schloemann of Dusseldorf, West Germany, will be delivered in mid 1955 and installed in the Perth Amboy, N. J. plant of General Cable Corp. Representatives of Schloemann will supervise installation of the press and the start of its operation. No date for operation has been set.

The initial announcement of General Cable Corp's order for the press, and the company's plans to commercially produce this country's first

These potential transformers weigh 800 lbs less than older types

SAVE TIME...SAVE SPACE ...SAVE STRUCTURE



ALL THAT IS NEEDED to lift these 69-kv potential transformers into place is a set of rope blocks — thanks to the savings in weight made possible by new Allis-Chalmers designs. In addition, they take up less space, require less foundation structure than other types of potential transformers.

Corona-Free Design Provides High Insulation Strength

The units are corona-free. They have high insulation strength and high thermal ratings. Long-time overvoltage tests have proved all voltage classes.

Construction Sturdy

Tanks are all-welded, hermetically sealed to protect insulation and oil from sludge formation. Unique bushing construction permits circulation of oil through the bushing and transformer, reducing oil requirements and permitting reduced transformer sizes.

It will pay to get all the facts on weight savings and quality design and construction of Allis-Chalmers current and potential transformers. For your copy of the technical paper "PT's Are Getting Smaller," consult the A-C office nearest you or write Allis-Chalmers, Milwaukee 1, Wisconsin.

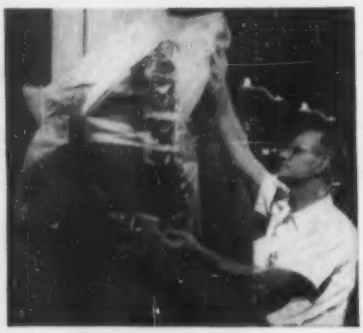
A-4483

COMPLETE LINE OF INDOOR AND OUTDOOR current and potential transformers offer weight savings ranging up to 40% of older types. Insulation strengths are greater and thermal ratings higher than could previously be provided.
High Voltage Potential Transformer
High Voltage Current Transformer

ALLIS-CHALMERS

direct-extruded aluminum sheathed cables, stimulated much interest in the communications, electric power and other industries.

Particular interest was shown, the two General Cable Corp officials declared, in the fact that aluminum sheathing is much less in cost per unit volume than conventional cable sheathing, that it is much lighter in weight and has much greater mechanical strength.



Bags Transformer

To help protect the finish of transformers in storage, General Electric Co's Distribution Transformer Department at Pittsfield and Holyoke, Mass., now ship the units in polyethylene bags. The cover prevents the collection of fly-ash and cinder dust on the transformer tanks. Finish of transformers in storage, according to GE engineers, is sometimes subjected to harder wear than when they are in service. In use, transformers generate heat which evaporates moisture. In addition to being placed in bags, the transformers are crated to offer an additional storage advantage.

Du Mont Sells WDTV

Television Station WDTV (Channel 2), Pittsburgh, has been purchased by Westinghouse Broadcasting Co, Inc., wholly-owned subsidiary of Westinghouse Electric Corp, from Allen B. Du Mont Laboratories, Inc. The purchase price agreed upon was announced as $9,750,000. The sale is subject to the consent of the Federal Communications Commission, and until such consent is given WDTV will continue to operate as a Du Mont station.

Reynolds Metals Seeks Plant Site in Wyoming

Wyoming National Resources Board reports Reynolds Metals Co. is continuing its investigations of the Lake DeSmet area near Buffalo, Wyo., for location of a power plant and aluminum reduction plant. There are vast supplies of water and coal at Lake DeSmet. The board said "much exploratory work must be done in order to prove the sub-bituminous coal deposits and ascertain the sufficiency of the reserves for the objectives of Reynolds Metal."

The board said Reynolds Mining Corp., a subsidiary of Reynolds Metals Co., is conducting the preliminary negotiations in the area.

Designs Suggest Module

F. W. Wakefield Brass Co, Vermilion, Ohio, has just issued ten catalog sections on lighting equipment, designed for copy brevity and simplicity in drawings and tables and utilizing maximum white areas.

The vari-colored covers have been designed in diamonds and squares to suggest the modular materials becoming increasingly available for lighting purposes. The designs were intended to appeal to architects and engineers who recognize the lighting equipment module in planning buildings.

MANUFACTURING BRIEFS

New Name—The American Society of Heating and Air-Conditioning Engineers, Inc. is the new name approved by voting members of the American Society of Heating and Ventilating Engineers. The Society's address is 62 Worth Street, New York 13, N. Y.

Glenn L. Martin Co, aircraft manufacturers in Baltimore, has announced that it has entered the field of nuclear power development. Tibor F. Nagey will be chief of the new Martin division. Reactors are to be developed, subject to governmental approval, and used for electric generation, industrial processes, propulsion and research.

American Welding Society announces formation of a council to plan, review, and coordinate the technical activities of the society. S. A. Greenberg, technical secretary of the society, is also secretary of the council.

Salford Electrical Instruments Ltd, London, is making a ⅓-octave spectrometer, capable of resolving the spectrum from 10 cps to 100 kc. It is said to be suitable for frequency analysis and production testing of transformers and amplifiers, and measurement of vibrations in turbine blades and rotating shafts. Spectra are displayed on a cathode ray tube.

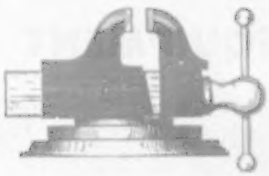
Business and Industry Censuses Begin Soon

The Census Bureau of the Department of Commerce will conduct the Censuses of Business, Manufactures, and Mineral Industries early in 1955 in accordance with Public Law 411 of the 83rd Congress, June 8, 1954. These censuses will bring up to date and improve statistics from previous censuses which now are from seven to 15 years old.

The bureau stresses the importance of prompt and accurate reporting and has published a list of industries and business to be surveyed. Among those indexed, together with the number of the forms each manufacturer should complete, are the items in the accompanying list.

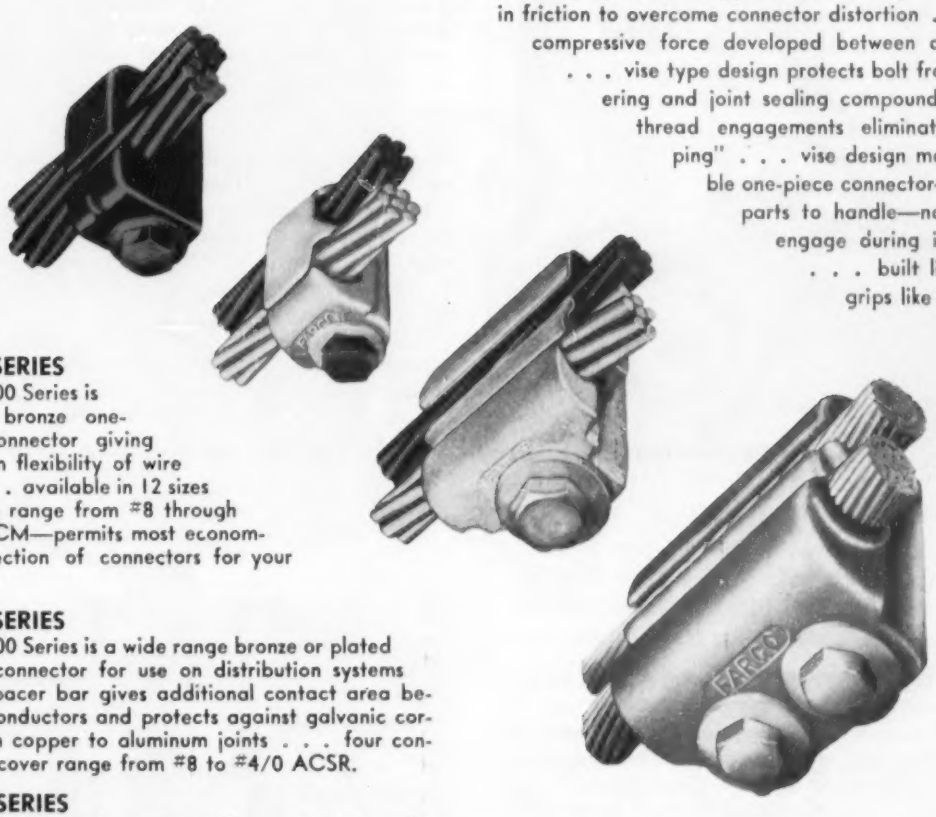
Form	Industry
MC-33H	Wire Drawing
MC-34J	Lighting Equipment
MC-35A	Steam Engines and Turbine and Hydraulic Turbines (except Locomotives)
MC-35Q	Industrial Furnaces and Ovens
MC-36C	Motors, Generators, and Motor-Generator Sets
MC-36D	Power, Distribution, and Specialty Transformers
MC-36E	Switchgear, Switchboard Apparatus, Industrial Control
MC-36F	Electrical Welding Apparatus
MC-36G	Misc. Electrical Equipment for Industrial Use
MC-36J	Insulated Wire and Cable
MC-36L	Electric Lamps, Components
MC-36N	Electron Tubes
MC-38A	Instruments

ALL FARGO CONNECTORS* are "VISE-TYPE"



VISE TYPE?

. . . small proportion of applied wrench torque dissipated in friction to overcome connector distortion . . . high compressive force developed between conductors . . . vise type design protects bolt from weathering and joint sealing compounds — long thread engagements eliminates "stripping" . . . vise design makes possible one-piece connector—no loose parts to handle—no parts to engage during installation . . . built like a vise, grips like a vise.



5000 SERIES
. . . 5000 Series is a cast bronze one-piece connector giving maximum flexibility of wire sizes . . . available in 12 sizes covering range from #8 through 1000 MCM—permits most economical selection of connectors for your system.

8000 SERIES
. . . 8000 Series is a wide range bronze or plated bronze connector for use on distribution systems . . . spacer bar gives additional contact area between conductors and protects against galvanic corrosion in copper to aluminum joints . . . four connectors cover range from #8 to #4/0 ACSR.

9000 SERIES
. . . 9000 Series has extra wide contact areas for maximum conductor encirclement . . . well rounded corners minimizes danger of nicking conductor.

. . . thick, pure aluminum spacer when under pressure forms around the strands of conductor sealing out moisture or other corrosive media—reduces danger of electrolyte bridging gap between copper and aluminum conductors.

. . . cast in aluminum . . . available to handle aluminum to aluminum or aluminum to copper connectors from #8 through 500 MCM . . . plated connectors of same design are available for all purpose use.

Ask your Line Material Field Engineer for complete details.

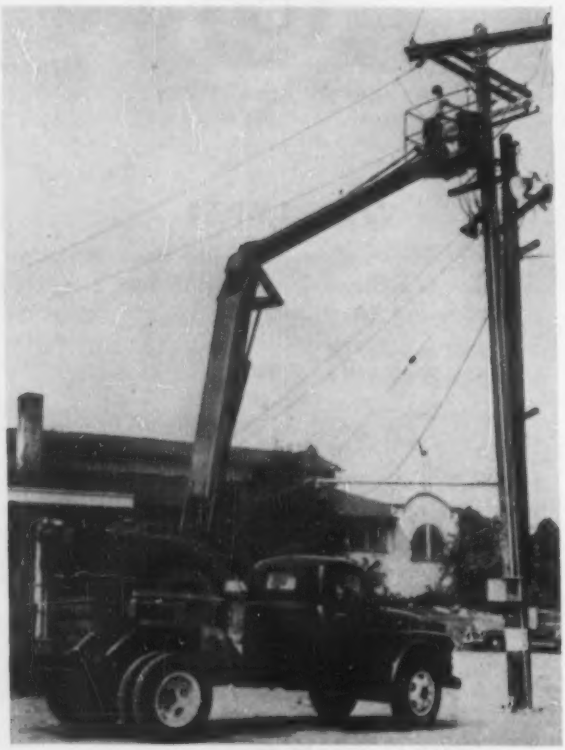
* Patented

FARGO

Manufactured by
FARGO MFG. COMPANY, INC.
Poughkeepsie, N. Y.

Distributed by
LINE MATERIAL COMPANY
(A McGraw Electric Company Division)
Milwaukee, Wisconsin

NEW EQUIPMENT



Aerial Platform

A hydraulically operated aerial platform called Giraffe can be attached to truck in a few hours. It hoists two average-sized men 40 ft for O. H. construction, also for street light and plant maintenance. This self-contained unit is operated by its independent power source—which also will operate a compressor or generator.

Giraffe's two-section boom can handle up to 450 lb at any radius with no outriggers, or can handle 1,000 lb at any radius with outriggers. The boom rotates in either direction, and its two sections move up or down independently or together. Upper end of the boom and platform are insulated against 7,500 v, but the insulation has withstood 30,000 v in tests.

Seamless steel tubing is used almost exclusively to carry hydraulic fluid. If the hydraulic line breaks, built-in restrictors lower the boom at a controlled rate.

Foot-operated controls in the working platform enable the operator to use both hands on the job. And a counterweight and hydraulically operated device, which lock out the truck springs, make it possible to move the truck with two men aloft.

Standard equipment includes a pipe inside the boom for transmitting air power to the platform, and a tube designed to serve as an electrical conduit.

Pitman Mfg Co, Room 522, 300 West 79th Terrace, Kansas City 14, Mo.

Remote Control, Supervision

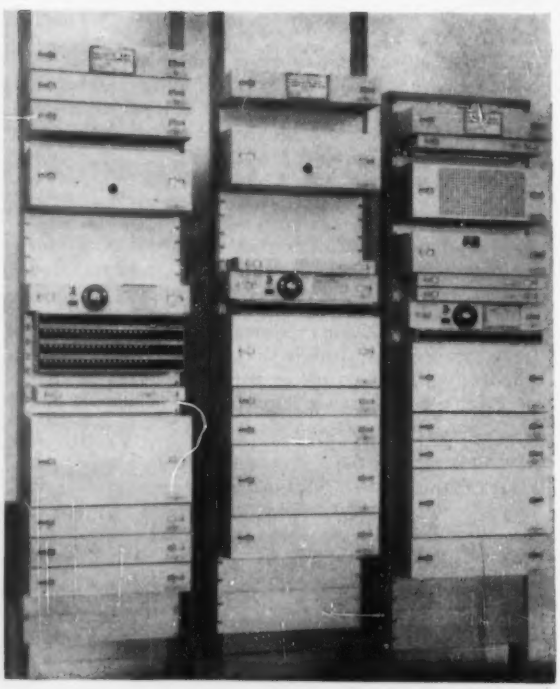
System for control and supervision of remote equipment locations, Type 51B, provides two essentially independent functions: A means for supervising conditions at remote locations from a control center; and means for controlling operations of equipment at remote locations from the control center. Information for both functions, consisting of dc pulses, is translated into tone signals for transmission over any suitable wire or radio circuit.

Standard system assemblies for the 51B are flexible individual operating requirements. Designed primarily for multi-station radio routes, the system can be used wherever information must be gathered from remote stations and transmitted to supervisory personnel at a central location.

Eight or more remote locations can be associated with each control center. The system can supervise as many as 80 remote conditions and control up to 90 operations.

Lenkurt Electric Co, San Carlos, Calif.

(*More New Equipment on page* 118)



The Most Famous Stock Number in Pole Line Hardware

The Hubbard "4-11-44" is known by its stock number from coast to coast. It's the most famous and most popular wireholder ever made.

Its popularity is no accident. It is designed on the principle, established by Hubbard 38 years ago, that for proper strength a wireholder must employ the metal parts for tensile strength, the porcelain parts for compression strength only.

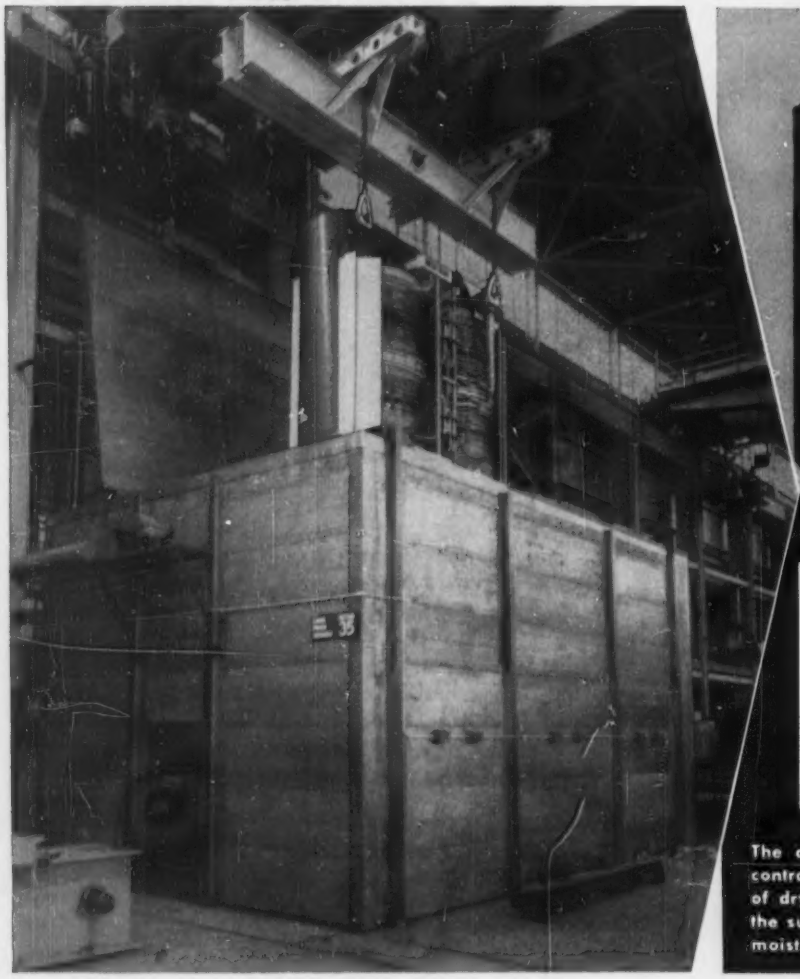
The heavy, strong Copperweld bail in the 4-11-44 resists corrosion and carries the load with undiminished strength for the entire life of the wireholder.

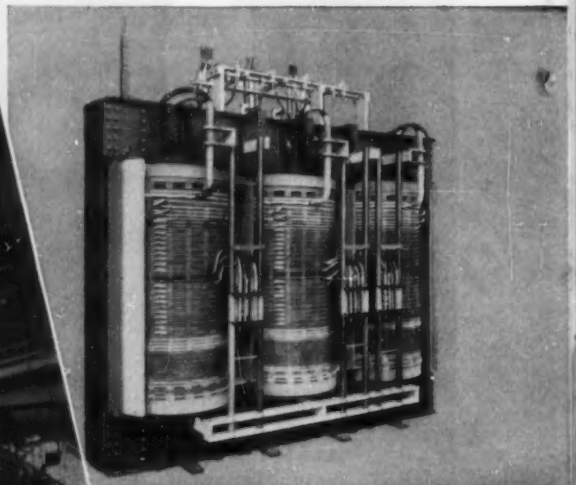
The porcelain is designed with smooth, large-radius contours that safeguard conductors against abrasion, and a wire hole measuring 7/8 by 1-inch, sufficiently large for any service entrance wires or cables.

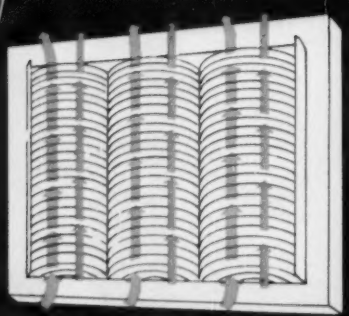
The 4-11-44 deserves its excellent reputation

HUBBARD AND COMPANY
PITTSBURGH • CHICAGO • OAKLAND CALIFORNIA
"Hang the load on Hubbard Hardware!"

Sahara in







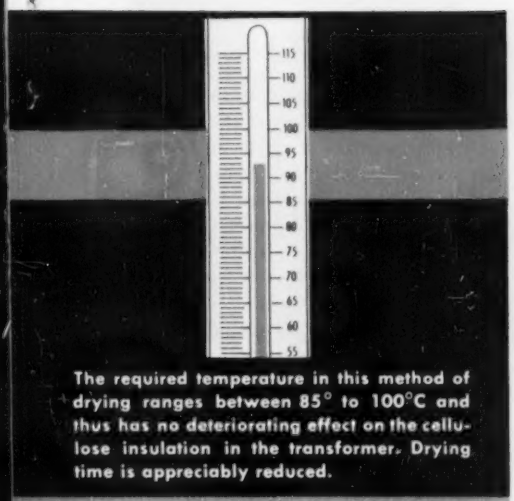
The dew point of circulating air is carefully controlled as compared to conventional methods of drying. At the end of the dehumidification the surrounding air contains only 1 10 grain of moisture per cubic foot.

M O L O N E Y E L E C T

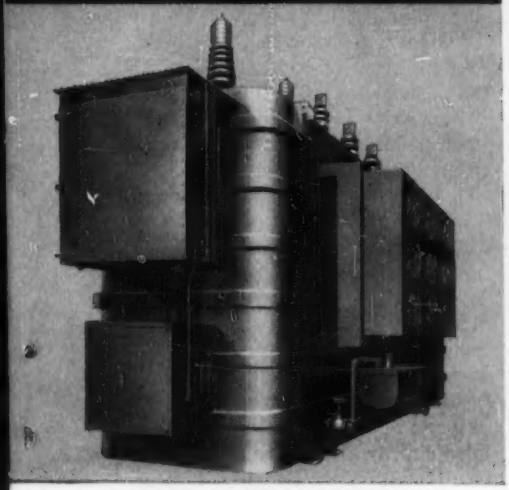
Power Transformers • Distribution Transformers • Step Voltage Regulators
Load Center Transformers • Unit Substations •. Network Transformers • Capacitors

SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES AT ST.

St. Louis . . .



The required temperature in this method of drying ranges between 85° to 100°C and thus has no deteriorating effect on the cellulose insulation in the transformer. Drying time is appreciably reduced.



THE drier your transformers are, the better they will perform; for moisture can affect performance . . . destroy dependability . . . shorten useful life. Moloney Power Transformers are carefully and completely dehydrated in a desert-like atmosphere. They are placed in a modern Monster Dry Air Oven where parched air is circulated at high velocity. All through the careful drying process, temperature and humidity are closely controlled. This permits faster and more effective drying of your equipment without affecting insulation life.

This new drying oven is installed in Moloney's new Large Assembly Bay, containing facilities and equipment necessary to produce power transformers of unlimited ratings to serve your system. For Moloney stands ready today, as it has throughout its 58 years of successful experience, to supply the needs of this nation's utilities.

MES4 20

R I C C O M P A N Y

Regulating Transformers • Load Tap Changing Transformers
Constant Current Transformers • Transformers for Electronics

LOUIS 20, MISSOURI AND TORONTO, ONTARIO, CANADA

You can't buy a BETTER wireholder

Smooth "Pulley-action" Wireway Prevents Conductor Chafing
Extra Sturdy Solid Copper Rivet
Large 1" x 7/8" Hole
Heavy Steel Cup-base and Yoke—A single steel stamping
Two Holes in Base Assure Effective Drainage
No. 22 x 2¼" Screw Assembled Solidly and Rigidly to Metal Base
Extra Sharp Threads and Quick-Starting Point make Driving Easy
No. 1986

Also available for pipe mounting, No. 2061-C

RUGGED, DURABLE, DEPENDABLE

When you want *Quality* and *Performance* in a wireholder, choose Porcelain Products' No. 1986! You just can't buy a better, more dependable wireholder! Porcelain Products' No. 1986 wireholder is made with strong, sturdy construction — metal in tension — porcelain in compression . . . for customer satisfaction. Steel parts, including the screw, are hot-dip galvanized—screw threads are extra sharp, lubricated for ease of installation. Larger, pulley-action wire hole—for easy installation of large wire sizes—prevent conductor chafing.

These *EXTRA* features—*plus*—Porcelain Products' "Quality Line" reputation—a byword for generations, make the No. 1986 wireholder the one to specify where you must discriminate . . . be quality conscious.

Quality You Can Trust

ELECTRICAL PORCELAIN SINCE 1894

60 years

Porcelain Products, Inc. PP INC.

FINDLAY, OHIO

Electronic Oven

Commercial microwave ovens using magnetron tubes have quick food-cooking qualities to speed up kitchen orders and increase seat turnover.

Housed in stainless steel cabinets, these Radaranges are available in two sizes. The larger, Model 1161, measures 26 × 26 × 64½ in., and has a heating chamber 20 × 12 × 22 in. Two magnetrons generate a maximum of 1,600 w to heat the food.

The small size, Model 1170, is designed as a counter unit. It measures 23 × 21 × 29¾ in. and oven is 14 × 10 × 18 in. A single magnetron produces a maximum of 800 w cooking power. It takes twice as long to cook food as the large size.

Both ovens operate on 208 to 230 v, single-phase, 60 cps. The neutral wire carries no current and can be used to ground the units. Conversion from 208 to 230 v is made by changing a transformer tap within the ranges.

The large unit consumes 1.02 kw on standby and about 5.3 kw on high heat. Its power factor is about 85%. The small unit uses half as much power.

Microwave energy at 2,450 mc—generated by QK-390 continuous-wave, air-cooled magnetrons—is coupled directly to the oven cavity. Metal walls and a door designed with appropriate chokes confine the energy in the oven. In addition, "hash filters" are built into the range to prevent the magnetrons and mercury vapor rectifiers from interfering with radio reception in the area.

Beamed at the food, the microwaves penetrate to a depth of about 2½ in. They set up molecular friction within

(*Continued on page* 120)

DOW

BASAL BARK TREATMENT requires all-around coverage of the basal area from the ground line upward 15 inches. Wet thoroughly until run-down or run-off is apparent. This method controls small brush and scrub trees in any season, keeps equipment busy.

BASAL BARK TREATMENT GIVES GOOD CONTROL IN ALL SEASONS

Spraying brush and trees with ESTERON 245 is effective all months of the year

Fresh-cut stumps may be treated in any season to prevent resprouting. Thorough coverage of entire stump, including the cut surface, all exposed roots and especially *all* the bark down to the ground line, is a "must."

Basal spraying may be done any month in the year. It should be planned to supplement your regular foliage spraying program, to keep your crews busy and your equipment in use the year around. This practice—spraying Esteron® 245 in oil on the basal 15 inches of brush stems or tree trunks—makes it easy to put the killing power where you want it.

Basal treatment with this product is done with a knapsack sprayer or with power equipment. It gives good results, regardless of the size of trees, provided that the basal area is thoroughly drenched to the point of run-off. Spraying cut stumps to prevent resprouting may also be done all months of the year.

Ask your supplier how Esteron 245 fits into a low-cost, year-around brush control program. Or write THE DOW CHEMICAL COMPANY, Agricultural Chemical Sales Department, Midland, Michigan. In Canada: Dow Chemical of Canada, Limited, Toronto, Canada.

you can depend on DOW AGRICULTURAL CHEMICALS

DOW

"FEDNEWS" PHOTO

Let There Be Light-

Sorry **— we're out of business today, and for many days. We've been forced to cut "interruptable" customers. Total loss in fire damage and power may exceed 10 million dollars.**

Here's what happened. Fire started in a circuit breaker and spread throughout the building. The roof crashed down. Giant steel beams sagged like ribbons. Concrete walls fell into the machinery. Engineers and repair crews are restoring our power output, but it will take time and plenty of money.

Moral: Prevent damage to equipment and interruption of power service with ENGINEERED "Automatic" FIRE PROTECTION. It involves analyses of your needs based on the machinery and equipment connected with your operation. Your hazard may best be protected by means of "Automatic" FIRE-FOG, AIR FOAM, CO_2 or a combination of these extinguishing mediums. The need is dictated by the degree of hazard, the demand for personnel safety, the high value of equipment, the requirements for uninterrupted business operations.

Learn how ENGINEERED "Automatic" FIRE PROTECTION can safeguard your plant — save you dollars while doing it. Mail the coupon for FREE descriptive literature.

"Automatic" Sprinkler Corp. of Amer.
Youngstown, Ohio

Please rush copy of Bulletin 64 — Design and Application of "Automatic" FIRE-FOG

Name_____

Title_____

Company_____

Address_____

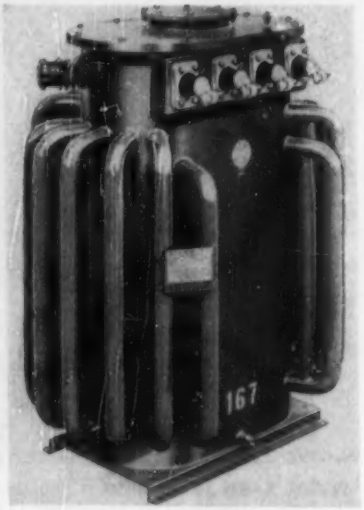
City_____ State_____

"Automatic" Sprinkler
CORPORATION OF AMERICA
YOUNGSTOWN, OHIO
Offices in principal cities of North and South America

New Equipment

(*Continued from page* 118)

the food which does the actual cooking. This saves time. For example, the large unit cooks a dish of mashed potatoes in about three minutes.
Raytheon Mfg Co, Waltham 54, Mass.



Distribution Transformer

A lightweight 167-kva single-phase distribution transformer employs an obround tank to yield a weight and size reduction, and to provide a compact, streamlined appearance. Available in all standard primary voltage ratings through 13,800 v, the transformer may be pole mounted to cut installation costs.

The transformer features uniformly high impulse level, low exciting current, high short-circuit strength, and short-time overload capacity of present Round-Wound transformers. The company announced that all of its single-phase transformers, 5 through 100 kva, will be redesigned to incorporate advantages offered by the obround tank. These units will be available as each design size is completed.
Line Material Co, Milwaukee 1, Wis.

Stringing Block

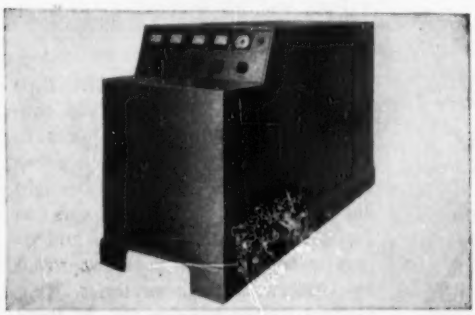
A 16-in. side-opening stringing block made of high-strength aluminum alloy has been designed for

(*Continued on page* 122)

PORTABLE test set has four wheels, equipped with roller bearings for smooth, easy handling.

GENERAL ELECTRIC'S D-C CABLE-TESTING SET IS SAFER, MORE ECONOMICAL

MOBILE set is mounted in a road trailer. The versatility of this equipment can be greatly increased by the addition of a fault-locating set.



STATIONARY set, rated 50 kv, 250 ma, has fully enclosed housing. It is ideal for a substation location.

To help protect the operator, General Electric's 50-kv d-c cable-testing set is fully enclosed—has an all-steel, dead-front panel. The high-voltage terminal for connecting to the cable is located at the rear of the cabinet, far from the operator, where it can easily be protected from accidental contact. Each set is provided with a discharge switch to automatically ground both the set and the cable under test when the set is de-energized.

It is economical to use a d-c set for installation acceptance and periodic cable tests, because of the low charging currents required, thus keeping the demand on station auxiliary power to a minimum. For this 50-kv set, the 230-volt power demand is only about 3 to 4 kw. Furthermore, because it is available in either 100 ma or 250 ma capacities, this same set is effective for fault reduction.

More and more utilities are finding G-E testing sets the ideal method for checking the condition of their cables. A simple comparison of the leakage current measured during periodic tests with that obtained during the original acceptance tests tells the story.

Available in stationary, portable or mobile models, this set has many features which contribute to its safe, economical operation. For more information about the 50-kv set or other G-E cable-testing units in ratings of 75 to 375 kv contact your nearest G-E Apparatus sales office or write for Bulletin GEA-4595. Address General Electric Company, Section 422-18, Schenectady 5, New York.

Progress Is Our Most Important Product

GENERAL ELECTRIC

we're working together

Today, the population of the United States is 162,000,000. In 10 years, there may well be *186,000,000* people. So America's public utilities executives are planning ahead. New facilities are on drawing boards. Others are being built. This far-sightedness will result in adequate power, heat, and lighting to meet tomorrow's consumer and industrial needs.

Guaranty Trust Company is working with public utilities. Our knowledge is gained from long association with the industry. You are welcome to draw upon this experience through our Public Utilities Division.

Guaranty Trust Company of New York *Capital Funds $395,000,000*

140 Broadway, New York 15

Fifth Ave. at 44th St. New York 36 · Madison Ave. at 60th St. New York 21 · 40 Rockefeller Plaza New York 20

LONDON: 32 Lombard St., E.C. 3 · Bush House, Aldwych, W.C. 2

PARIS: 4 Place de la Concorde BRUSSELS: 27 Avenue des Arts

Member Federal Deposit Insurance Corporation

New Equipment

(Continued from page 120)

stringing and sagging aluminum conductors. It is said to reduce the effort required when stringing the larger conductors, sizes up to ACSR 1,033,-500 cir mil, above the range of the 14-in. block.

The sheaves are fitted with sealed ball bearings that require no greasing. Grooves are machine turned to a smooth radius, large enough for passage of sleeve connectors and grips.

Frame has a built-in swivel to automatically keep the sheave in line of stringing. It is designed for use with both ball and socket or clevis type insulators.

The blocks are rated at 10,000 lb tension limit. Weight is 18 lb.

The Dicke Tool Co, Downers Grove, Ill.

Selenium Rectifiers

Selenium rectifiers suitable for circuit breaker tripping and reclosing have a power factor of 97%, efficiencies ranging from 86 to 92%, and a dc ripple of about 4%. They are available as water-cooled, fan-cooled, convection-cooled or combined fan-convection cooled units. Their copper bus bars operate at low current density. The rectifiers may be paralleled.

Walker Division, Norma-Hoffman Bearings Corp, Stamford, Conn.

Safety Switches

Safety switches in 30, 60, 100, 200, 400, and 600 amp capacities feature solderless lugs and feed-through neutral for quick, easy installation. Ample gutter space is provided to speed wiring. Visible knife blades promote safety, and all live parts are completely recessed to minimize accidental contact.

The Noark Type D (NEMA Type G) switches are of dual blade construction and have fewer joints to yield cool operation and trouble-free service. They are housed in raintight enclosures with mounting ears to facilitate installation on posts and irregular surfaces. They are approved by Underwriters' Laboratories.

Federal Pacific Electric Co, 40 Paris St, Newark, N. J.

(*More New Equipment on page* 126)

NEW CHEVROLET TRUCKS

keep going longer, keep going for less!

From the day you first put it on the job until the time comes to trade, your Chevrolet truck's going to do more work for you while you spend less to keep it going. Here's why you can count on it—

INCREASED POWER SAVES YOU PLENTY

Chevrolet's high compression ratio (in each of its three great engines) develops more power. That means you go longer before filling the tank! It means, too, you've got extra power handy whenever you need it—for greater acceleration, for an easier pull up steep grades, for steadier going through mud and sand on off-the-road jobs. So, you save not only on operating costs—you save *time* as well.

GREATER RUGGEDNESS PAYS OFF IN LONGER LIFE

Two-ton models, for example, are equipped with heavier axle shafts. All models have newly designed clutches and stronger frames. The best part of it is that, throughout their longer life, you spend less for their upkeep. For complete details about the model you need, see your Chevrolet dealer. He'll tell you whatever you want to know, then give you the best news of all: Chevrolet trucks are priced lower than all other lines! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

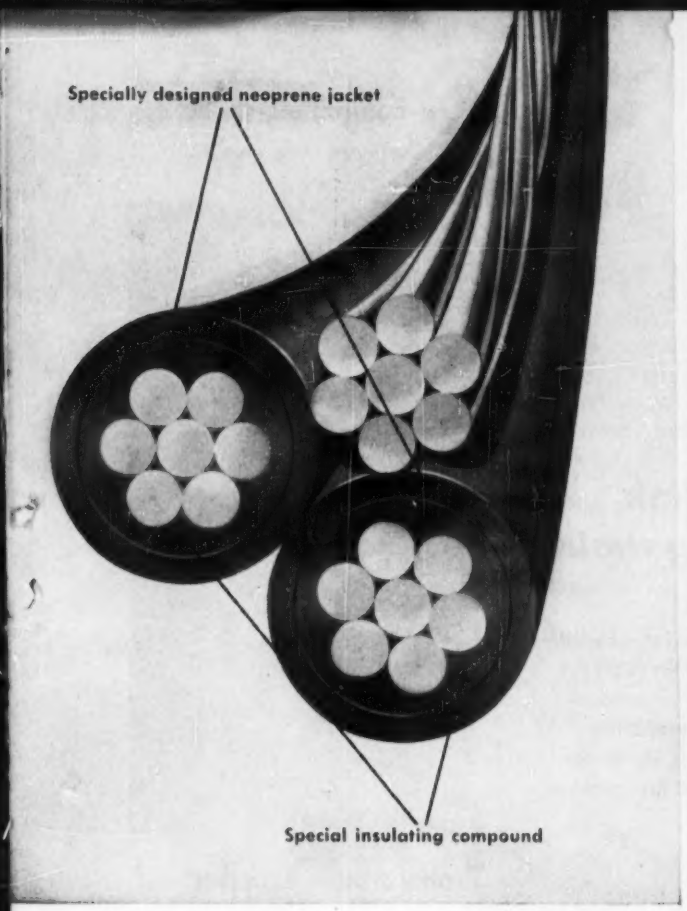
MOST TRUSTWORTHY TRUCKS ON ANY JOB! CHEVROLET

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **NEW TRUCK HYDRA-MATIC TRANSMISSION***—offered on ½-, ¾- and 1-ton models. Heavy-Duty **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **DIAPHRAGM SPRING CLUTCH**—improved-action engagement. **HYPOID REAR AXLE**—for longer life on all models. **TORQUE-ACTION BRAKES**—on all wheels on light- and medium-duty models. **TWIN-ACTION REAR WHEEL BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—greater holding ability on heavy-duty models. **NEW RIDE CONTROL SEAT***—eliminates back-rubbing. **NEW, LARGER UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES**—give increased load space. **COMFORTMASTER CAB**—offers greater comfort, convenience and safety. **PANORAMIC WINDSHIELD**—for increased driver vision. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—easier, safer handling. **ADVANCE-DESIGN STYLING**—rugged, handsome appearance.

**Optional at extra cost. Ride Control Seat is available on all cabs of 1½- and 2-ton models, standard cabs only in other models. "Jobmaster 261" engine available on 2-ton models, truck Hydra-Matic transmission on ½-, ¾- and 1-ton models.*

SERVICE DROP



DOUBLE PROTECTION is important feature of Anaconda 2 + 2 Type N-SD service drop. Note inner and outer layers.

CABLE ENDS of Anaconda 2 + 2 Type N-SD are quickly and easily made ready for service connection.

Unique construction gives Anaconda 2+2 Type N-SD Cable double protection

NOW Anaconda offers a new Type N-SD service-drop cable – called 2 + 2. *Each* of its two conductors is covered with not one–but *two* durable, protective layers.

One layer is a fine insulating compound. The other is a tough jacketing material.

The compound for the inner layer has built-in electrical qualities – designed for heat and moisture resistance.

The outer layer is in fact a specially designed neoprene jacket – best for wear and weather resistance.

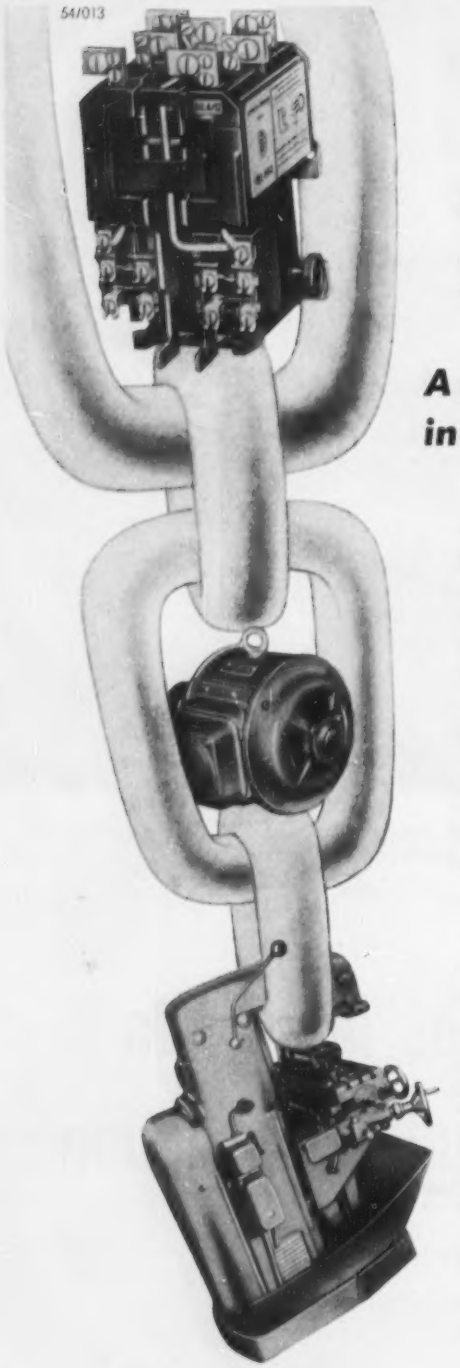
Together these two layers give *double* protection. That means longer life . . . greater service reliability.

See this cable for yourself. The Anaconda Representative nearest you will be glad to show you samples...and to answer your questions. Call him today. Or for more information, write *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

ANACONDA®

Power cables of all description • service and overhead distribution cable, bare and weatherproof, including ACSR • signal, control and communication wire • portable cords and cables • network cable • magnet wire • copper, aluminum and copperweld conductors • wire and cable accessories.

◀ **LINEMAN ON POLE** handles ANACONDA 2 + 2 Type N-SD Cable easily. Minimum effort speeds the lineman's work.



A robust link in a strong chain!

Machine – Motor – Switchgear, Three links in an important chain in production. If, for instance, the switchgear fails, the motor cannot run and the machine is idle.

Lifelong service without maintenance or repair are the necessary fundamental features of any switchgear to ensure a strong link in machine control.

We supply electrical switchgear with a service life matching that of your machine, without servicing or exchange of contacts, which means appreciable advantages for you as well as for your customers. It will eliminate your worries and avoid break downs due to electrical parts which may render the whole machine valueless.

Moreover, it saves unproductive maintenance staff.

KLÖCKNER-MOELLER·BONN

ELECTRICAL SWITCHGEAR · ENCASED CONTROLS · DISTRIBUTION PANELS

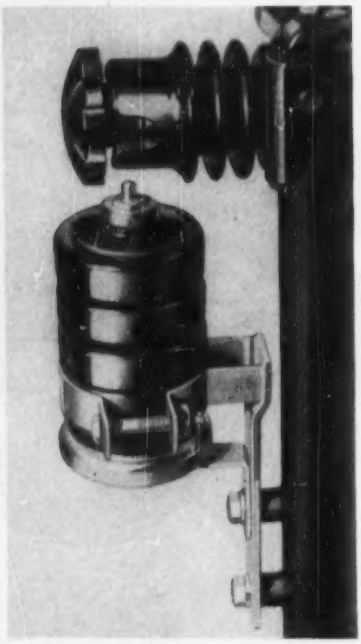
Represented in the United States by:

AMERICAN KLOECKNER-MOELLER-CORPORATION

4113 East 11th Street, Tulsa 12, Oklahoma, Tel. 6-3048

New Equipment

(*Continued from page* 122)



Transformer Arrester

Open gap valve arresters for side or cover mounting on RWP distribution transformers have a low-impulse sparkover and low IR drop. These Type T arresters limit and positively interrupt 60-cps follow current. The "hot" terminal is placed a prescribed distance from a line terminal. The arrester's ground terminal is connected to the transformer tank. The arresters are rated at 10 kv for cover mounting, and 3 and 6 kv for sidewall mounting.

Line Material Co, Milwaukee 1, Wis.

Enclosed Motor

A rib-type enclosed, fan-cooled wound-rotor motor has been made with slip rings, brush rigging, rotor and stator enclosed in a single frame. Approved by Underwriters' Laboratories, the motor is available in ranges of 7.5 to 100 hp, 1,800 rpm and slower speeds, frames 284 to 505, and in standard enclosed or explosion-proof construction. The motors are rated for a 55C rise.

The motor's frame has an extended front end to cover slip rings and brush

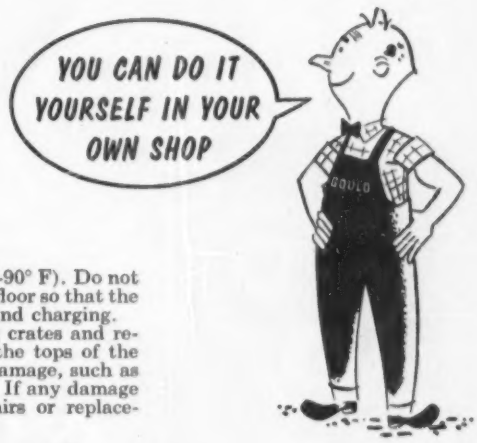
(*Continued on page* 128)

HERE'S MONEY SAVING TIP #3

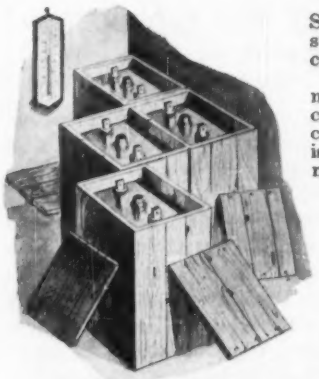
from the GOULD Plus-Performance Plan

HOW TO STORE A WET BATTERY

Frequently it becomes necessary to store batteries for an extended period of time before they are placed in service. To be sure that the batteries are maintained in the best possible condition during this storage period, the Gould Plus Performance Plan shows you how to do it yourself.



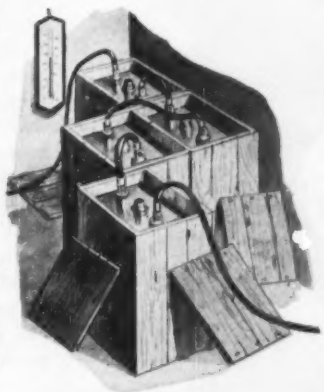
1. Open and Inspect



Select a cool, dry room for storing (60°-90° F). Do not stack the crates, but have them on the floor so that the cells will be accessible for inspection and charging.

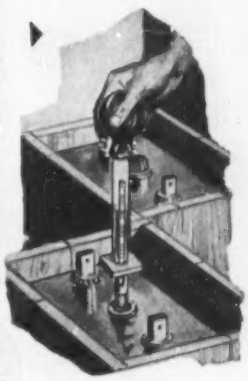
Remove the tops from the shipping crates and remove packing material from around the tops of the cells. Examine the cells for shipping damage, such as cracked jars, spillage or other damage. If any damage is apparent, have the necessary repairs or replacements made at once.

2. Connect in Series



Connect the cells in series, negative to positive and then connect to some DC source of power where a low rate of charge can be obtained. Connect the positive terminal to the positive lead of the charging source and the negative terminal to the negative lead of the charging source.

3. Check Specific Gravity



Every thirty days take hydrometer readings of several cells. If any cell reads as low as 1.200 specific gravity, charge at the recommended finishing rate until a constant voltage and specific gravity are obtained for 4 readings taken at hourly intervals. These readings should be taken while the cells are on charge. In the event the charging equipment available does not have sufficient voltage to charge the entire battery at once, the battery may be split up into smaller units and each unit charged separately.

GOULD Batteries

GOULD-NATIONAL BATTERIES, INC.
TRENTON 7, N. J.

For Railroad Air Conditioning and Lighting | For Mine Shuttle Cars and Locomotives | For Electric Industrial Trucks | For Diesel Locomotive Starting | For Standby and Emergency Power

©1954 Gould-National Batteries, Inc.

Always Use Gould-National Automobile and Truck Batteries

There are many ways in which you can cut battery maintenance costs. Doing simple jobs like this, in your own plant, is the answer. The Gould Plus-Performance Plan gives you the "know-how" to "do it yourself." Send for the complete plan and start saving money. Mail this coupon TODAY!

BATTERY INFORMATION HEADQUARTERS
Dept. EW-124 Trenton 7, N. J.

Please send me, without charge or obligation, the Gould Plus-Performance Plan for _____ batteries.
(type or types)

Name _____

Firm _____

Address _____

City _____ Zone _____ State _____

Collyer Suprene Type RR is as much at home in the air as it is underground . . . serves equally well in aerial, direct earth burial, or duct installations. Available for all voltage ranges, in shielded or unshielded constructions. Send for samples and recommendations, or give details on your own special requirements.

Collyer

COLLYER INSULATED WIRE CO., 245 ROOSEVELT AVENUE, PAWTUCKET, R. I.

New Equipment

(*Continued from page* 126)

rigging. This provides added surface for heat dispersal. Brushes and slip rings are maintained through two large pipe plug holes in the upper quadrants of the frame. Slip-ring leads are brought out to a separate cast-iron conduit box. A straight shaft or a tapered shaft can be provided on either or both ends.
Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

MORE NEW PRODUCTS
about which you should know

Bailey Meter Co, 1050 Ivanhoe Rd, Cleveland 10, Ohio has instrument **recording pen** fed from plastic ink sac with year-long supply. As many as four pens can trace on parallel time arcs only 0.042-in. apart.

Relyon Products Co, 3124 W. Touhy Ave, Chicago 45, Ill. reveals a non-breakable **insulating sleeve** for covering bare terminals of high-voltage transformers, yet permitting signs to be changed or removed quickly.

EPIC Inc, is American distributor for Hartmann & Braun's (Germany) **rapid recorder** which uses a special immediately visible photographic paper and an almost pin point high-pressure Hg lamp as the light source.

Dow Corning Corp, Midland, Mich. has "ready-mix" expansible resin powders for **silicone foam** structures. Non-toxic, R-7001, R-7002 and R-7003 remain stable up to 700 F, and exhibit good physical and electrical properties. Water absorption after 24-hr immersal ran 2 to 3%; thermal conductivity about 0.3 Btu/hr/sq ft/degree F/in. Expanded foam can be cut with wood-working tools.

Crown Industrial Products Co, 1223 Amsterdam St, Woodstock, Ill. are making hardened steel hand-type **wire strippers** that handle both stranded and solid wire. Blades are precision-milled and interchangeable.

Jefferson Electric Co, Bellwood, Ill. announces 17 dual-element Saf-T-Lag **fuses** for home wiring systems.

IT'S NEW! IT'S EXCLUSIVE!

Position indicator drag hands reset from ground . . .

on Westinghouse pole-type regulator

Here at last is the first completely equipped regulator that can be 100% operated from the ground. It is the Westinghouse URL-16 pole-mounted, step-voltage regulator—now furnished with a new position indicator.

An exclusive new pushbutton reset is located at the bottom of the indicator and is cup-shaped to take a hookstick. It is spring loaded for fast, easy resetting of the drag hands from the ground. Drag hands show at a glance the maximum steps the regulator has operated to raise and to lower voltage since the last reading. The indicator is inclined 25° for high readability from the ground. Hands are big and in contrasting colors. The dial size and numerals are extra large for quick, accurate readings. Dials bear standard NEMA markings.

Now it is practical to make more frequent load checks for less money. Since no pole climbing is necessary, only one man is needed. Operating procedure is streamlined at a saving in dollars.

Booklet B-6053 contains complete information on the full line of Westinghouse voltage regulators. If you don't already have your copy, contact your Westinghouse representative or write: Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-10435

YOU CAN BE **SURE**...IF IT'S

Westinghouse

READERS FORUM

It Didn't Look This Way Before

Readers with good memories may recollect seeing the illustration above in a previous issue. When it appeared on page 82 of the Nov. 29 issue, it was one of the illustrations in "Modern Power Dispatch Evaluates Line Losses," by D. C. Harker and M. C. Westrate of Commonwealth Associates, Inc. Unfortunately at that time there were a number of errors in the names of the power plants. The editors sincerely regret this and apologize to both the authors and the officials of Consumers Power Co.

Voltage Nomenclature—2 Explanations

To the Editor:

On page 85 of the Nov. 29 issue the editors invite discussion on voltage nomenclature. Apparently there is general misunderstanding relating to the use of nomenclature, and it is possibly due to the difference in standard nomenclature as used in "EEI-NEMA Preferred Voltage Ratings for A-C Systems and Equipment," EEI Publication R-6, NEMA Publication 117, dated May, 1949 and the "NEMA Standards for Transformers," Publication TRI-1954, dated May, 1954.

In the Preferred Voltage Standards there seems to be a preference when expressing Wye-connected systems to state the voltage-to-neutral followed by a slant, then the voltage between phases followed by a Y. For example: 2400/4160Y would indicate a Y-connected circuit, 2400 volts-to-neutral and 4160 v between phases.

There are several transformer connections that can be used on this system. For example, a Wye-connected transformer with a neutral available, designated 4160Y/2400, or a Wye-connected transformer without a neutral available, designated 4160Y might be used. NEMA Standards for Transformers, Publication TRI-1954, describes other connections which might also be used. A similar description appears in ASA C57.12a—1954.

When a system other than those listed in the Preferred System Voltage Standard is introduced, it should follow the established nomenclature. Therefore, the new system should be designated 277/480Y, independent of what load might be connected to the system.

Transformers for use on the new system would follow the present transformer standard which describes the nature of the connection. For example, a Wye-connected transformer with a neutral available would be rated 480Y/277.

Therefore, in the question raised for the particular case, "480Y/277 or 277/480Y—Which?" with the neutral available, the 277/480Y refers to a 4-wire, 3-phase system of 277 v to neutral and 480 v between phases.

J. B. Hodtum, Manager
Central Station Eng Dept
Allis-Chalmers Manufacturing Co
Milwaukee 1, Wis.

To the Editor:

On page 85 of the Nov. 29 issue the editors invite readers to express their preference on whether 480Y/277 or 277/480Y should be used.

In the case of transformers the way you name this voltage is determined by the actual winding and terminal arrangement. Thus the 480Y/277 is the rating of a transformer capable of delivering 480 v, 3-phase, 4-wire with 277 v available from each line to neutral. This rating does not provide for a 277-v, 3-wire delta supply.

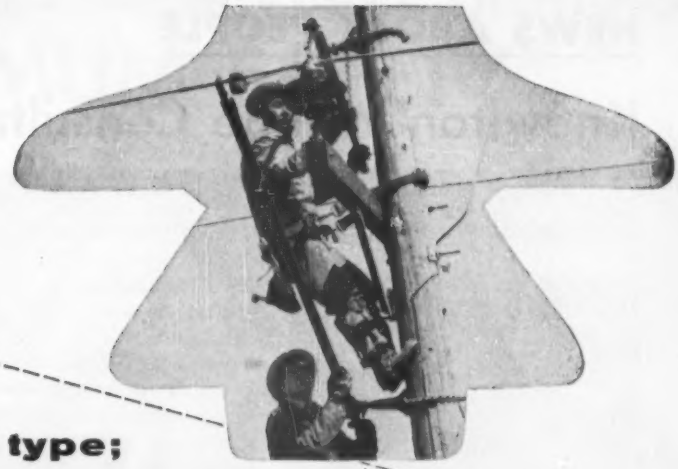
On the other hand a rating of 277/480Y is used when the transformer can supply either a 480-v, 4-wire Y circuit or be reconnected for 277-v, 3-wire delta.

The transformer regularly used for this service supplies the 4-wire circuit, and the higher voltage should therefore always be shown first. This is equally true of 208Y/120-v transformers in spite of nomenclature practices that have grown up to the contrary.

It seems logical that the system supplied by the transformer be similarly rated from the standpoint of which voltage comes first. There are often good reasons for naming the actual system 460Y/265 v as 480Y/277 represents the no-load secondary voltage of the transformer. In the case of the lower voltage system it might continue to be called 208Y/120 as many of the supplying transformers actually have a no-load rating of 216Y/125 v. If the transformer has a low voltage rating of 208Y/120 v, then the standard supplied from it might more logically be called 199Y/115 v.

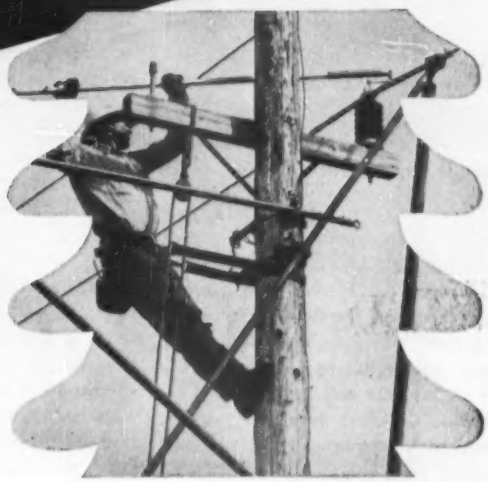
The important point is that the higher of the two voltages should be shown first in all cases except where the transformer and the system are actually capable of being reconnected for delta operation at the lower of the two voltages.

H. M. Jalonack
Manager, Marketing Research
General Electric Co
Pittsfield, Mass.



You pick the right type;

WE'LL PROVIDE THE BEST



Sometimes you've probably wondered:

"Given the same (or nearly so) M&E values, will a Pintype or Post serve best on this line?"

It's a question that has been asked of us many times. Usually we can cite a number of similar, successful lines, some of which have Pintype Insulators, and some of which have Posts. Without an intimate knowledge of the proposed line and the history of its region, we can't logically express a preference.

But there is some help to be had from Ohio Brass Company. Just as choosing the right type depends on your knowledge of the line and others like it, getting the best of that type depends on the knowledge of the manufacturer you select; on his ability to produce good insulation of all types.

Ohio Brass makes both Pintypes and Posts; has no reason to favor one over the other. We make them equally well, and make them to the best of our ability. And so instead of choosing a "shape", you can choose the M&E characteristics needed. When you find them, you've picked the right type; we'll make the best of that type!

Ohio Brass

MANSFIELD OHIO, U.S.A.

4441-H

NEWS ABOUT PEOPLE

Knowlton Will Be Consultant

Senior associate editor will retire Dec. 31 after 24 years on Electrical World staff but will continue to edit Handbook

ARCHER E. KNOWLTON

Archer E. Knowlton, senior associate editor of Electrical World, will retire on Dec. 31. He has been named consulting editor, the first on the staff for at least 20 years, and will continue to advise the engineering staff. Much of his time will be spent at his Short Beach, Conn., residence where he plans to do technical writing and editing.

Knowlton started with this magazine in 1930 as an associate editor. Since then he has been the guiding, and often the working, hand behind many of its engineering features. He specialized in industry-wide studies, usually in the field of generation in which he was an expert.

Knew Many Utility Engineers . . . He originated EW's method of covering technical meetings which places great emphasis on the discussion following papers rather than on the papers themselves which usually are available later. In covering some 600 of these gatherings, he traveled throughout the country and became acquainted with every top-ranking utility engineer in the past 20 years.

In the years following the depression and during the war, Knowlton edited all of the main technical articles in EW and wrote many of them. When the war ended and the staff was expanded, he was named senior associate editor.

When he left the Yale faculty to join EW, he brought with him profound scholarship, engineering integrity, and a broad understanding of science. He had taught mathematics and physics at Trinity College for nine years and electrical engineering at Yale for eleven, leaving with the rank of associate professor.

Believing that the best teacher is one with a practical knowledge of the subjects he is teaching, Knowlton dovetailed his teaching with 19 years as an engineer for the Connecticut Public Utilities Commission. This work gave him a solid foundation on which to build his technical editing career.

Active in AIEE . . . He joined the American Institute of Electrical Engineers as a student member. His interest in the institute never died. He became a full member in 1917 and a fellow in 1930. A mere listing of the committees, local, sectional, and national, on which he served would fill a column. As far back as 1926, he served as chairman of the Connecticut Section.

National committees of which he has been chairman include: Instruments and Measurements, Meetings and Papers, Award of Institute Prizes, Edison Medal, Board of Examiners, and Winter General Meeting.

He is also a member of the American Society of Mechanical Engineers and the National Association of Corrosion Engineers.

In 1938, McGraw-Hill Book Co named him editor of the sixth edition of the "Standard Handbook for Electrical Engineers." He proceeded to change it from a supplementary textbook for college engineering students to a hand encyclopedia and practical reference work for the practising engineer. He also edited the seventh edition (1949) and will edit the eighth edition due in 1956.

Educated at Trinity and Yale . . . Knowlton was born in New Haven, Conn. He received his BS in EE degree from Trinity College in 1910 and his master of science degree in 1912. His electrical engineering degree was secured at Yale in 1921. He also studied at Columbia University.

•

Douglas Wallace, formerly district manager at Pittsburgh for Graybar Electric Co, Inc, has been named assistant vice president, effective Jan. 1. Wallace, who started with Graybar in 1922, will work with Vice Pres E. W. Cashman, who heads up the firm's inside operations.

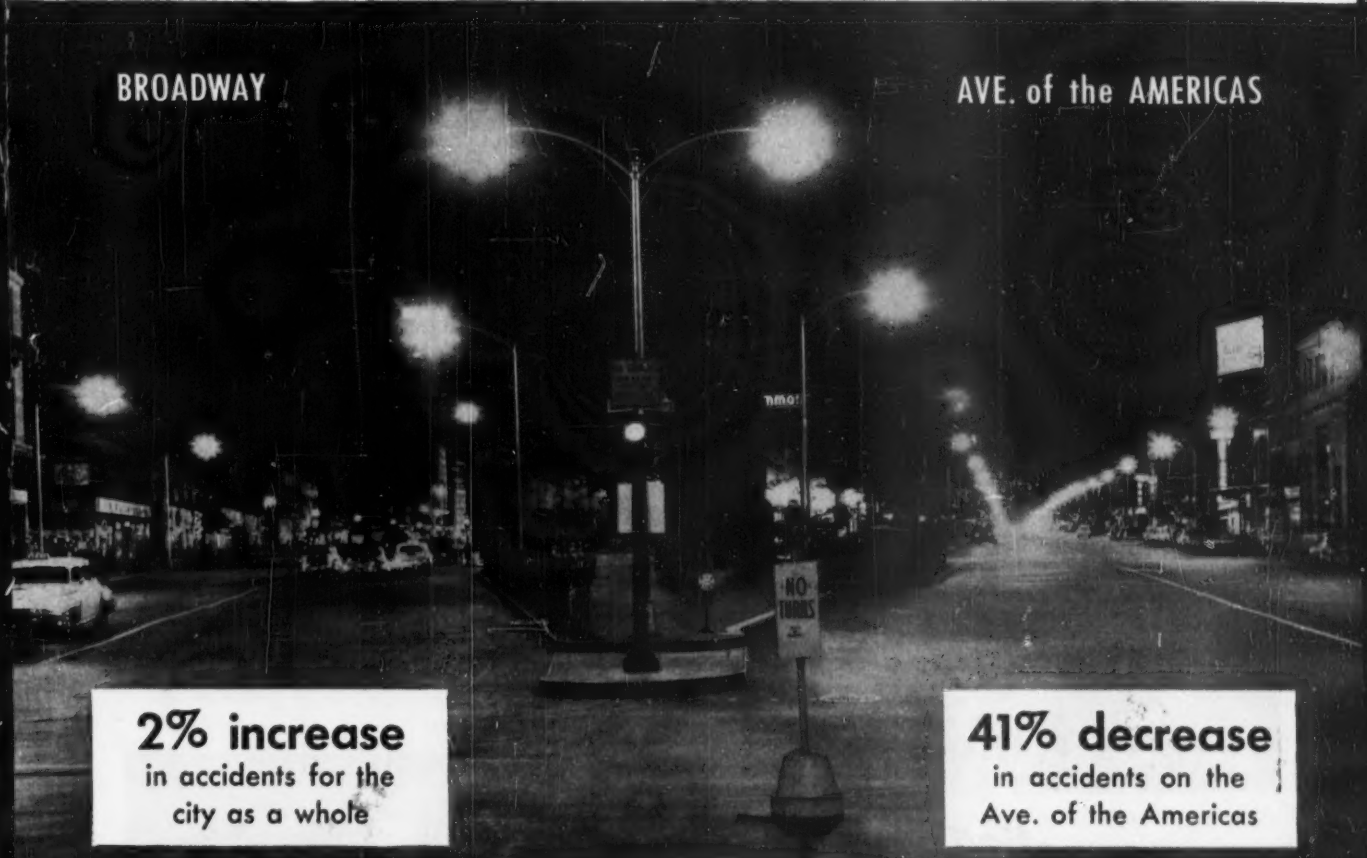
William C. Anderson has been advanced from assistant to chief project engineer in the Engineering Division of Jefferson Electric Co. Bellwood, Ill. In another promotion, **Dr Herbert O. Rost,** who joined the firm two years ago as a research engineer, was advanced to chief development engineer. **Irving B. Friedman** was promoted from electrical engineer to chief of the electronics section of the Engineering Division.

Robert M. Myers has been named industrial relations manager for the Lighting Division of Westinghouse Electric Corp. Myers, who has filled several industrial relations posts since joining Westinghouse in 1933, replaces **David A. McQuade,** who has been transferred from Cleveland to Boston, Mass., as industrial relations manager for the firm's Sturtevant Division. McQuade succeeds **G. E. Closson,** who is being transferred to the industrial relations department at company headquarters located in Pittsburgh, Pa.

Norberg Made President

Carl F. Norberg, executive vice president of Electric Storage Battery Co, has been named president. He succeeds S. Wyman Rolph, who has resigned as chairman, president and director. Rolph had been with the firm for more than 38 years. Since joining the company in 1925, Norberg has served in many capacities. He was made director in 1948 and executive vice president in 1950.

HOLOPHANE REFRACTORS for MERCURY LIGHTING Provide MAXIMUM SAFETY*



2% increase
in accidents for the city as a whole

41% decrease
in accidents on the Ave. of the Americas

GIVE US THE FACTS MAN!... This time the New York City Police Department provides the proof . . . Six months after the installation of new mercury-vapor luminaires equipped with HOLOPHANE PRISMATIC REFRACTORS on the Avenue of the Americas, official police records show the following:

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- Injuries from accidents were down from 77 to 45 (−41%)
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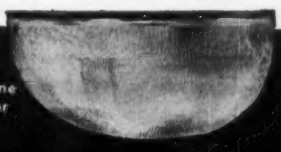
New Street Lights Hailed As Accident Rate Drops

Improved lighting is largely responsible for a 41 per cent reduction in traffic accidents on the Avenue of the Americas between Thirty-second and Fifty-ninth Streets in the first six months of the year, Millard Henlein, executive secretary of the Avenue of the Americas Association, declared yesterday.

For the city as a whole, Mr. Henlein said, traffic accidents and injuries increased 2 per cent in the six months, compared with the first half of last year.

N. Y. TIMES, AUGUST 5, 1954



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SEALING COMPOUNDS

C. H. Lanphier Heads Sangamo

Illinois firm names veteran employee to top post to succeed D. S. Funk, newly appointed board chairman

C. H. LANPHIER

C. H. Lanphier, executive vice president and chief engineer of Sangamo Electric Co, Springfield, Ill., has been elected president, effective Jan. 1. He replaces D. S. Funk who was appointed to the newly created post of chairman of the board.

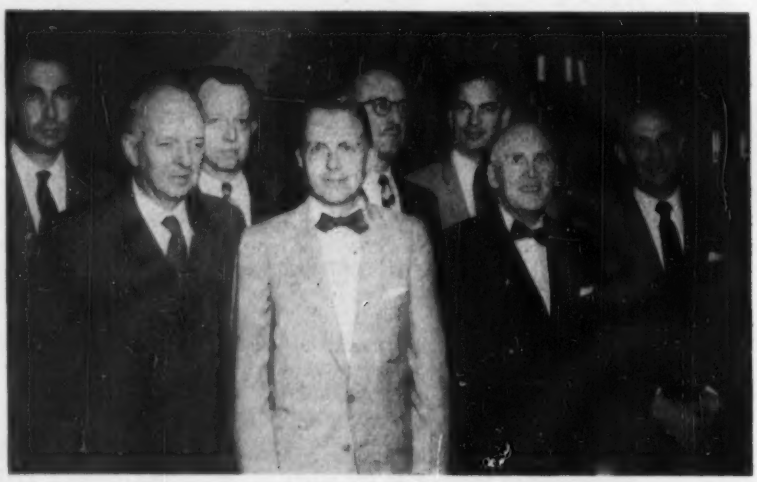
The newly elected president started his career with Sangamo in 1931 after graduation from Yale University. Beginning in the engineering department, he served successively as technical assistant and assistant to the general superintendent before becoming assistant to the president in 1939.

Lanphier was elected treasurer and a member of the board of directors in 1943. He was advanced to executive vice president in 1952.

Following graduation from Yale in 1917, Funk became affiliated with Sangamo. He was vice president and general manager of the Illinois firm prior to becoming president in 1939.

•

Alexander Kidd, formerly vice president of the M. W. Kellogg Co, New York, has been elected a vice presi-



Power Club Elects Officers, Directors

Officers and directors for 1955 elected at the December meeting of the Interstate Power Club are (left to right): J. A. Swaney, Delaware Power & Light Co, secretary-treasurer; Dean W. Taylor, New York State Electric & Gas Corp; H. W. Memmott, Connecticut Light & Power Co; T. C. Roe, Delaware Power & Light Co, chairman; C. E. Blaisdell, Pennsylvania Power & Light Co; L. D. Flinchbaugh, Central Hudson Gas & Electric Corp, vice-chairman; John H. MacNeal, Consolidated Edison Co of New York, Inc; and S. L. Chapin, Public Service Electric & Gas Co.

dent of Stewart-Warner Corp, Chicago. Kidd had served 34 years with the Kellogg company.

Dr Ledo R. Carletti has been placed in charge of all Brown Boveri Corp's consultations on super-charging of diesel and gas engines. Dr Carletti, who has been serving in the firm's New York offices since last June, formerly was associated with Worthington Corp in Buffalo where he was a consulting engineer on super-charging of gas engines.

OBITUARY

Walter D. Steele, 84, who had been associated with Benjamin Electric Manufacturing Co since its founding in 1901, died Dec. 9 at Evanston, Ill. Steele, a co-founder of Benjamin Electric, became actively connected with the firm in 1907 as its vice president in charge of sales and manufacturing activities. He was president from 1928 until last fall (EW, Sept. 27, p 48) when he retired to serve in a consulting capacity.

John J. Janak, Jr, 49, superintendent of generation for Texas Power & Light Co, died at Gladewater, Tex., Dec. 8 of injuries received in an automobile accident. He had been with Texas P&L for 18 years.

Charles L. Crosby, 61, manager of the Richmond district office of the General Machinery Division of Allis-Chalmers Manufacturing Co for the last 14 years, died Dec. 8. Crosby, an electrical engineer, had filled numerous field sales posts since joining Allis-Chalmers in 1923.

Wilfred T. Lowery, 61, Toledo Edison Co staff electrical engineer, died recently at Toledo, Ohio. With Toledo Edison since 1916, Lowery filled several engineering posts before becoming chief electrical engineer in 1950. Three years later he was appointed staff electrical engineer.

Joseph P. Kenney, 80, retired official of Pennsylvania Power & Light Co, died recently at La Anna, Pa. Keeney, a pioneer in development of steam-generated power after the turn of the century, was superintendent of plants for Pennsylvania P&L in the Harrisburg district until retiring in 1941.

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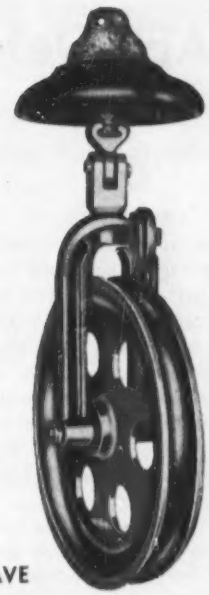

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AEC Defends MVGC Contract

Strauss at press conference says contract is not unfavorable to either government or taxpayer; SEC hearings continue

Chairman Lewis Strauss of the Atomic Energy Commission met the press for the second time in 18 months last week to defend his agency's contract with Mississippi Valley Generating Co, the new Dixon-Yates power firm. At the same time, that company's plans for financing its new steam plant on the Mississippi River continued to be the subject of lengthy Securities and Exchange Commission hearings.

Strauss issued a 36-page statement to the press which explained chronologically the events leading to negotiations with Edgar Dixon and Eugene A. Yates, who head the holding companies which are now seeking SEC approval of equity financing for MVGC. The AEC chairman released preliminary drawings of the site selected for the new steam plant showing the plant's location behind the river levee, planned coal-loading equipment and barge arrangements.

LEWIS STRAUSS

Contract Is Fair to Taxpayer . . . He defended the contract as being "reasonable and fair to the government, and therefore to the taxpayer," and denied that it was part of a program to kill the Tennessee Valley Authority.

Questioned closely by correspondents from newspapers which have repeatedly attacked the contract as a give-away, Strauss said he regrets that the AEC-Dixon-Yates contract was necessary. He said he did not know why TVA did not negotiate on its own with the private utilities, so that it would not have been necessary for AEC to contract for its own power.

Strauss said at one point that, if the incoming Democratic Congress should order cancellation of the power contract, or if for some other reason it cannot be implemented, AEC probably would draw off some of the TVA power going to other consumers in the area. He said that, since AEC has a "first call" on TVA power, there is little likelihood of a shortage of electricity for AEC's atom plants, even if it means depriving other TVA consumers of their supply.

He emphasized that, in view of the fact that other defense industries in the Tennessee Valley area receive power through the TVA system, there is no doubt that the contract with MVGC fills a defense need.

At the SEC hearings, which were running into their third week, Dixon, president of Middle South Utilities, Inc, one of the MVGC sponsoring companies, continued to come under fire from Joseph Volpe, member of the Washington law firm of Volpe, Boskey and Skallerup, which has been retained by 36 public power groups intervening in the MVGC financing application. MVGC is seeking SEC approval of issuance of 55,000 shares of $100 par value common stock to Mid-South and the Southern Co. Its program for borrowing an additional $100 million to complete its investment in the steam plant will come up for SEC consideration later.

For several days Volpe followed a line of questioning designed to develop the conditions under which the Dixon-Yates proposal was born. Dixon and Yates have explained their roles in the negotiations, and the approximate timing of events leading up to their participation, but they have continued to be repititiously cross-examined.

Volpe has asked SEC to subpoena all pertinent documents from the companies' files, and a ruling has not yet been made on this request. Dixon, however, has told the commission the sponsors have submitted all written data in their possession which have a bearing on the matter at hand.

Alco Bid Wins Army A-Plant Contract

Despite the fact that its successful $2,096,753 bid was just about half the anticipated cost for construction of the Army Corps of Engineers' portable package atomic power plant, American Locomotive Co does not expect to take a loss on the job.

Alco underbid 17 other qualified firms in an intensely competitive effort to get the contract for construction of the 2,000-kw power plant on the banks of the Potomac River adjacent to Fort Belvoir, Va. It submitted what was described at the Atomic Energy Commission as the "thinnest" proposal, which made AEC's and the Engineers' job of selection easier.

In announcing the contract award, which came less than a month after receipt of bids, the Engineers explained that Alco's bid was most favorable to the government not only from the standpoint of price, but also because of excellence of design and specification compliance.

33 Firms Submit Bids . . . Bid quotations were close, with 12 of the 18 bids submitted being under the $4-million unofficial AEC estimate. Thirty-three carefully-screened firms had been asked to bid.

Design requirements were wide open, and this was understood to be the key to the low Alco bid quotation. Since AEC and the Engineers had no way of knowing what proposed designs would be, they had, apparently, no accurate way of anticipating the price spread reflected in the bids, which ranged from Alco's $2 million upwards to $6,900,000.

The Engineers hope mainly to get from the prototype information on construction, operation and maintenance, as well as a demonstration of the capabilities and limitations of the small plant. Chief feature of the reactor is that each component will be easily transportable by air. AEC will share the cost with the Engineers.

POWER BRIEFS

● Preliminary construction work is under way for Southern California Edison Co's $24-million steam generating station at Alamitos, east of Long Beach, Calif. Plant will initially contain one 156,000-kw unit. Eventually four such units will be installed with the first scheduled for service late in 1956.

● Niagara Mohawk Power Corp is putting its abandoned Riverside steam plant in North Albany up for sale for possible industrial use. It has been dismantled and its equipment has been sold. Plant was retired after the new Albany steam plant in Glemont was opened.

● California Oregon Power Co expects to spend $10 million on a construction program slated to be completed in 1955. Allocation of sum calls for $5 million for local additions and improvements and $5 million for hydro plant construction.

● Potomac Edison Co has completed work on projects costing $3 million which are designed to boost power supply and provide the Frederick area with better service. Project included a 132,000 v transmission line and revamping of the old Frederick transmission and distributing substation.

● Dedication ceremonies were held last month for the third new unit installed at Cincinnati Gas & Electric Co's Walter C. Beckjord Station near New Richmond, Ohio. The 125,000 kw generator, largest single unit in the company's electric system, brings plants capacity to 325,000 kw and boosts company's total electric generating capacity to 885,000 kw.

● Coos-Curry Electric Cooperative, Inc, of Coquille, Ore., has asked Federal Power Commission for a preliminary permit to investigate a proposed 140,000-kw Bald Mountain hydro site on the Illinois River.

● Plans to spend about $18 million in 1955 for new construction have been announced by San Diego Gas & Electric Co. Utility's 100,000-kw Encina generating Unit No. 1 has gone into operation and excavating for the second 100,000-kw unit has been started at site near Carlsbad, Calif.

● Virginia Electric & Power Co has topped the 1 million kw output for the first time in its history. Peak of 1,007,600 kw was used Dec. 7 between 5 and 6 pm.

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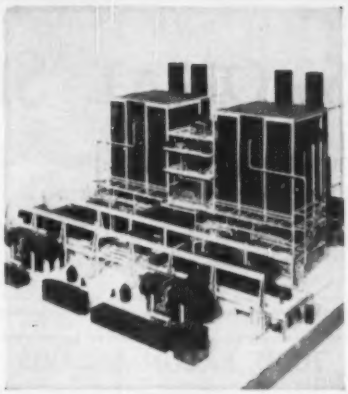

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SAN FRANCISCO: 68 Post St. (4)

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DISTRIBUTION ENGINEERS — Competent graduate electrical engineers with approximately 10 years experience design, operation and maintenance of distribution facilities required by rapidly growing utility desirable location South America. Portuguese or Spanish useful—not required to start. Reply stating age, education, experience, personal particulars and minimum salary expected. P-4927, Electrical World.

DISTRIBUTION ENGINEERS—Graduate Electrical engineers—senior approximately 10 years field experience with operating utility company. Junior at least 3 years experience. Permanent position long established consulting organization New York. Some travel Latin America necessary in future. Knowledge of Spanish or Portuguese useful. Salary commensurate with experience. Reply stating age, education, experience, personal particulars and minimum salary expected. P-4928, Electrical World.

EMPLOYMENT SERVICES

SALARIED PERSONNEL. $3,000-$25,000. This confidential service established 1920, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

SALARIED POSITIONS $5,000 to $35,000. We offer the original personal employment service (established 44 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered, present position protected. Ask for particulars. R. W. Bixby, Inc., 655 Brisbane Bldg., Buffalo 3, N. Y.

POSITION WANTED

AVAILABLE FOR Brazil Electrical engineer with several years' experience with large American firm in Rio, good organizer speaks fluent Portuguese. PW-4856, Electrical World.

PERIODICALS

A.I.E.E. transactions back-volumes wanted to buy for cash. Ashley 24 E. 21, N.Y.C. (10).

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4313) will be received at Denver, Colorado, until January 20, 1955, for furnishing five 115-kv (550-kv BIL), 1,200-ampere 3,500,000-kva, 5-cycle interrupting time, power circuit breakers for Fargo Substation, Missouri River Basin Project, North Dakota. Delivery is desired within 300 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

New and Used Equipment Available for
POWER PLANTS, SUBSTATIONS, TRANSMISSION LINES AND CONSTRUCTION
Send for new list to
EBASCO SERVICES INCORPORATED
APPARATUS EXCHANGE **Two Rector St., New York 6, N. Y.**

ELECTRICAL ENGINEER

Professional license in or transferable to Connecticut. Knowledge of plant layout and piping, to work with new system for electrical warming of piping carrying viscous fluids. To be administrative project engineer in charge of team of ten semi-professionals.

SALARY $8000-$10,000

Please send resume to

P-4983, Electrical World
330 W. 42 St., New York 36, N. Y.

WANTED
MANUFACTURER'S REPRESENTATIVE

For States in New England. Well established manufacturer selling to the electric utility industry. Your reply will be held confidential. Give full particulars on territory covered and lines now handled. Address all replies to

RW-4507, Electrical World
330 W. 42 St., New York 36, N. Y.

ELECTRICAL ENGINEERS

Young Graduate Electrical Engineers wanted by midwest electric utility. Openings in several departments and field offices. $4,000.00 and up. Excellent opportunity for advancement with this progressive company. Company paid pension, liberal vacations and other benefits. Contact: Personnel Director:

INTERSTATE POWER COMPANY
DUBUQUE, IOWA.

MANUFACTURER'S REPRESENTATIVE

To represent New York manufacturer for heavy duty cast copper bus and ground connectors. Also specialty fittings for substations, power distribution systems and industrial plants. Must have contacts power companies and consulting firms. Advise regarding non-conflicting lines now handled and territory covered. All replies strictly confidential.

RW-4770, Electrical World
330 W. 42 St., New York 36, N. Y.

COMING

January 24, 1955

51st ANNUAL STATISTICAL ISSUE

To the reader, (over 25,000) it is an indispensable working tool, a compendium of fact, a basic reference, the "answer man" to a thousand questions.

To the advertiser, it delivers all the benefits and by-products of a peak reader interest, high traffic, long use advertising vehicle. You benefit from the day it is pulled out of its wrapper until the following January when World's newest Annual Statistical Issue arrives.

Place your advertisement where it will speak for you all year long.

Closing Date—January 14, 1955 for Classified Advertisements.

Reserve Your Space Today.

Classified Advertising Division
ELECTRICAL WORLD
330 W. 42 St. N. Y. 36, N. Y.

RE-NU-BUILT
GUARANTEED

ELECTRIC POWER EQUIPMENT

MOTOR GENERATOR SETS
3 ph., 60 cy.

Qu.	KW	Make	Speed	DC Volts	DC Volts
1	3000 3U	G.E.	514	600	4000/13200
2	2000/2400	G.E.	450	250/300	2300/4600
2	2000	G.E.	514	600	6600/13200
1	2000	G.E.	503	666 25 cy.	11000
2	2000	G.E.	450	600	2300/4600
1	1500	C.W.	514	115	4000/13800
1	1500	G.E.	720	600	13200
1	1000	G.E.	900	260	4100/6900
3	1000	G.E.	720	600	2300/4600
2	750	G.E.	720	275	2300/4600
1	500	Whse.	1200	125/250	2300
1	500	Whse.	900	250	440
1	500	G.E.	720	125	2300

TURBO GENERATORS

Qu.	KW	Make	Desc.
1	4000	G.E	Condensing—425 lbs—750° F.T.T.—Surface Condenser 3/60/2300—4000 v with exciter
1	1000	G.E.	Non-Cond—190 lbs—2400—3—60
1	1000	Moore	Condensing — Extraction—190 lbs., 2400—3—60—Surface Cond
1	750	G.E.	Condensing—265 lbs., 440—3—60 Built 1944
1	600	Moore	Non-Cond—150/200 lbs., 5/35 lbs. B.P., 480—3—60 Dir. Conn. Exciter.
1	300	G.E.	Non-Cond—150/175 lbs., 5/10 lbs. B. P. 480—3—60

FREQUENCY CHANGERS

Qu.	Kva	Make	Cycles	Voltages
1	13800	Whse.	60/25	13200 x 13200
1	3750	G.E.	60/25	4150/2400 x 2400/4160
1	3125	G.E.	25/60	4150/2400 x 2400/4160
2	2500	G.E.	25/62½	2300 x 4160
1	1250	G.E.	25/58.3	4400 x 2300
1	625	A.C.	25/60	11000 x 2300

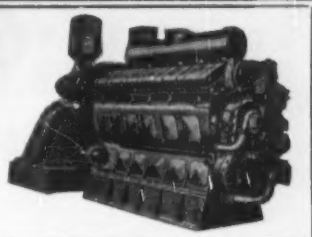
TRANSFORMERS—60 Cycle

KVA	Make	Type	Ph	Voltages
1—5000	Whse.	OISC	3	33000x26400/13200
1—2500	Whse.	OISC	3	26400/13200 x 480
1—3000	G.E.	HVDDJ	1	66000 x 13800/
2—667	G.E.	HD	1	13800 x 230
3—1250	G.E.	HVDDJ		6600/550
3—1000	G.E.	HVDDJ	1	2300/480

BELYEA COMPANY, INC.
51 Howell Street, Jersey City 6, N. Y.

DIESEL POWER

IMMEDIATE SHIPMENT
• **PURCHASE OR RENTAL**
UNIT CAPACITIES—10 TO 2475 KVA
A.C.—50 AND 60 CYCLES
• **ALSO D.C. UNITS**



A PARTIAL LISTING OF OUR INVENTORY

KW	Make	Model	HP	RPM	KW	Make	Model	HP	RPM
1180	Worthington	SEH-8	1685	360	320	Superior	60E-6	460	450
1136	Fairbanks Morse	38D	1600	720	300	General Motors	8-268A	430	1200
1100	General Motors	16-278A	1600	720	250	Clark	GD-4	375	360
750	General Motors	12-567	1080	720	200	General Motors	8-268A	350	900
700	Worthington	EE-8	1000	327	175	General Motors	12-71	275	1800
600	General Motors	12-567	850	600	150	Worthington	CO-4	225	450
500	General Motors	8-567	720	720	150	Buckeye	80	240	600
500	Alco	6-12ix13T	750	600	148	Fairbanks Morse	32E11	220	300
350	Baldwin	VO-6	510	450	100	General Motors	3-268A	150	1200
320	Enterprise	DSG-6	480	450	80	General Motors	6-71	90	1200

A. G. SCHOONMAKER COMPANY, INC.
DIESEL DIVISION, 50 CHURCH ST., NEW YORK 7, N. Y.

PORTABLE 300 K.W. DIESEL ELECTRIC
GENERATOR SET

2300 V.—3 Ph.—60 Cy.

Built for over the road portability. Self supporting skids with radiator, all piping and instruments. Under 8 feet total width. Switch gear and air starting for remote installation. Less than 1,000 hrs. since complete overhaul.

$17,500.00 f.o.b. cars
Lake Andes, South Dakota

AL JOHNSON CONSTRUCTION CO.
608 Foshay Tower Minneapolis, Minn.

TRANSFORMERS

FOR SALE

3—1000 KVA Mol. 13200-2400/4160Y
3—1000 KVA Mol. 11500-2400/4160Y
3— 833 KVA G-E 35000—480
3— 500 KVA G-E 26400—240/480
5— 333 KVA W-H38000-7200/12470Y
3— 333 KVA G-E 33000-2300/4000Y/6900/-11950Y
3— 333 KVA G-E 33000-2300/4000Y
3— 333 KVA Mol 7200/12470Y-2500/4160Y
3— 200 KVA W-H 13200-230/460
3— 150 KVA G-E 19050/33000Y-2540/4000Y
5— 150 KVA G-E 7200/12470Y-240/480
3— 100 KVA G-E 33000-6900/11950Y

Many other items in stock

TRANSFORMERS WANTED

Reliable rewind and repair service on all makes of transformers

THE ELECTRIC SERVICE CO.
Cincinnati 27, Ohio
40 Years Dependable Service

WANTED

DIESEL ELECTRIC UNITS

Needed Used Diesel Electric Units from 2500 K.W. to 5000 K.W. Sea level rating to generate at 2400/4160 volts three phase-60 cycles, history, prices, place & time of delivery.

Post Office Box 1324
New York 8, New York

ELECTRICAL **WIRE** AND **CABLE**

—Your Best Source—
- for every industrial and power application
- Odd lengths—long and short—reasonably priced
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Let us quote on requirements—send your inquiries
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EAstgate 7-4777 Code: UNIWIRE

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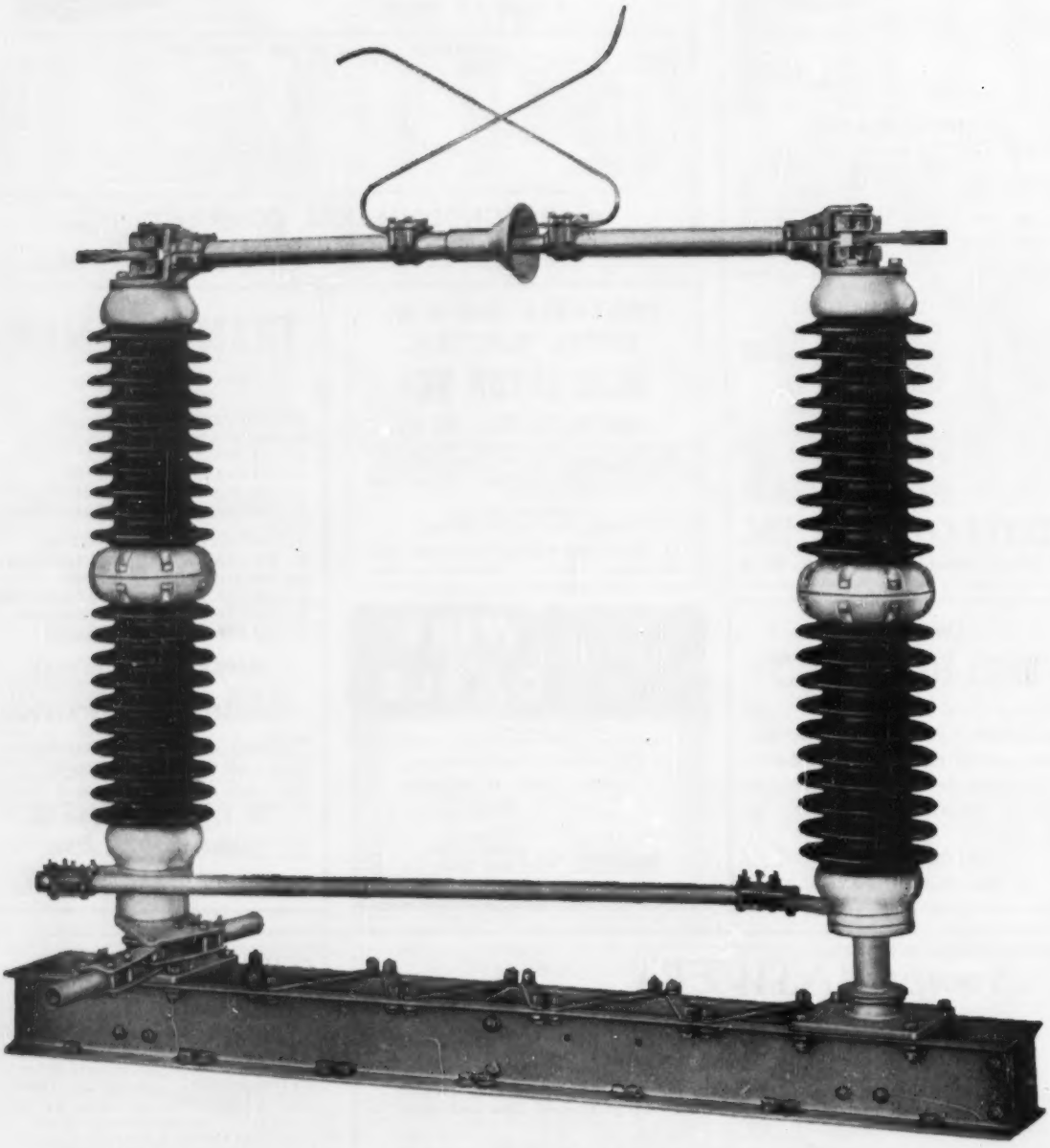


AIR BREAK DISCONNECTING SWITCH

115,000 Volts—600 Amperes—Type PU

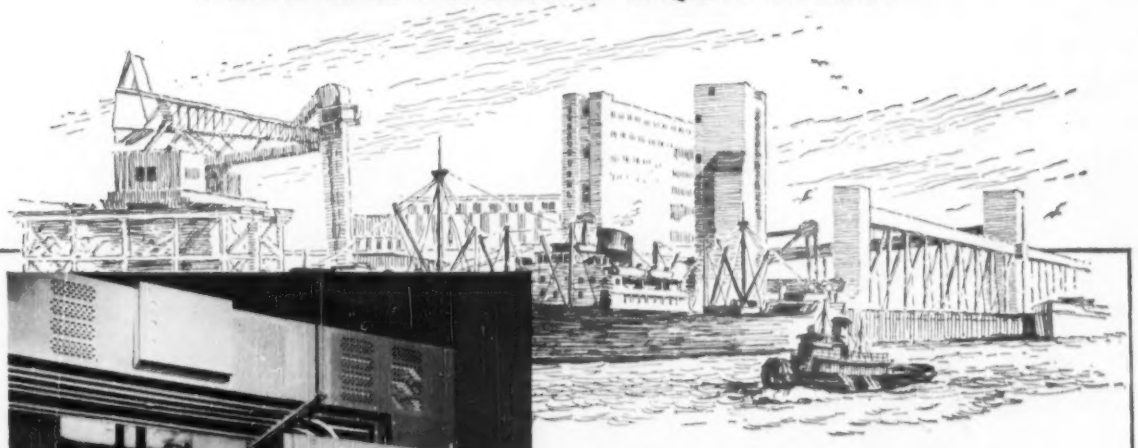
Horizontal Mounting—Three Pole—Center Side Break—Group Operated

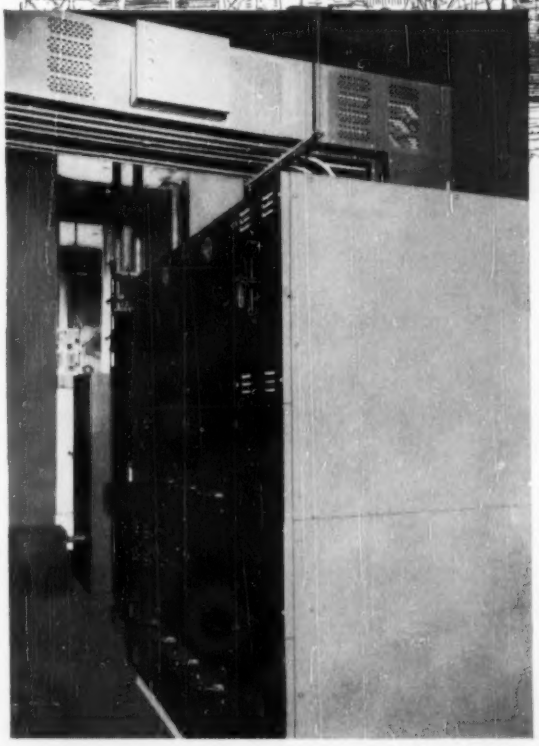
SILVER TO SILVER CONTACTS

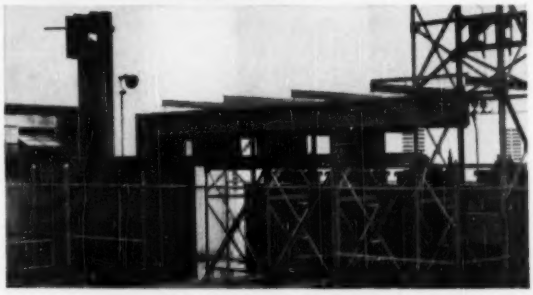
One Pole Shown

See Bulletin 40A

FOR TODAY'S MOST MODERN GRAIN ELEVATOR, FEDERAL PACIFIC EQUIPMENT







At left; top: Federal Pacific Low Impedance Bus Duct feeding from Distribution Switchboard. Bottom: Transformer top outlets with Service Duct to outdoor Switchgear . . . Electrical construction by Fischbach & Moore, Inc., Victory Electric Works, New Orleans. General contractor, Fegles Construction Co., Inc., Minneapolis. Engineers, Jones-Hettelsater Co., Kansas City.

THE RECENTLY COMPLETED New Orleans Public Grain Elevator has an extensive "hazardous location" electrical system for which Federal Pacific has supplied the distribution equipment. From the outdoor substation, Federal Pacific Service Duct carries electric energy into the main building where Low Impedance Duct feeds six distribution center electric rooms on different levels. Throughout the main building, silo storage section, conveyor belt ramps and the handling and ship-loading equipment in buildings along the dock, Federal Pacific Switchgear and Safety Switches help facilitate the handling of an average of seven million bushels of grain per month.

Federal Pacific electrical equipment for light and power is today's top specification. Most of this equipment is economically assembled from standard units . . . and it is designed and engineered for easy installation, complete efficiency and ready adaptability for future changes.

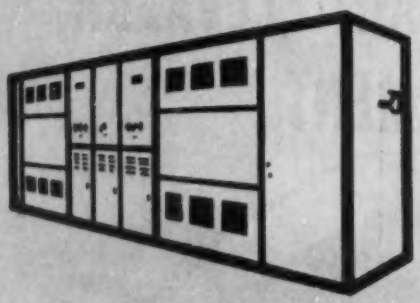
Submit your electrical distribution problems to Federal Pacific for study and suggestions. Write Federal Pacific Electric Company, 50 Paris Street, Newark 1, New Jersey.

FEDERAL PACIFIC ELECTRIC CO.

FORMERLY—FEDERAL ELECTRIC PRODUCTS COMPANY AND PACIFIC ELECTRIC MANUFACTURING CORP.

Main Office: 50 PARIS STREET, NEWARK 1, N. J.

Federal Pacific products: Stab-lok Circuit Breakers, Motor Controls, Safety Switches, Service Equipment, Industrial Circuit Breakers, Panelboards, Switchboards, Control Centers, Bus Duct, High voltage circuit breakers and power switches ★ Sales offices in principal cities.



KUHLMAN ELECTRIC COMPANY — BAY CITY, MICHIGAN — CRYSTAL SPRINGS, MISSISSIPPI • EXPORT REPRESENTATIVES: INTERNATIONAL STANDARD ELECTRIC CORP., 15TH FLOOR, 50 CHURCH ST., NEW YORK 7, N.Y. • CABLE: MICROPHONE, N.Y.

KUHLMAN

KUHLMAN UNIT SUBSTATIONS ASSURE POWER WHERE, WHEN, AND HOW IT IS REQUIRED